ADMINISTRATION OF THE FEDERAL COAL-MINE SAFETY ACT, CALENDAR YEAR 1956

By James Westfield, H. F. Weaver, and C. M. Keenan

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Marling J. Ankeny, Director

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FOREWORD

This publication presents the Annual Report of the Division of Coal-Mine Inspection, Bureau of Mines, for the calendar year 1956, as transmitted to the Congress by the Secretary of the Interior pursuant to the requirements of the Federal Coal Mine Safety Act.

It is believed that the report reproduced herein contains pertinent information important enough to present as an information circular and be made a permanent record as a Bureau publication. Annual reports for 1953, 1954, and 1955 have been published as Information Circulars 7685, 7734, and 7765, respectively.

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James Westfield,[1] H. F. Weaver,[2] and C. M. Keenan[3]

CONTENTS

	Page
Summary	1
Introduction	4
Background	4
The Advisory Committee	5
Employment of personnel	6
United States Civil Service Commission requirements for Federal coal-mine inspectors	6
Written description of some phase of coal mining	6
Experience	6
Provisions of law	7
Substitution of education for experience	8
Ability to drive automobiles	8
Citizenship	8
Physical abilities	8
Basis of ratings	9
United States Civil Service Commission basic requirements for mining engineers	9
Tentative selection and probational appointment	9
Training of personnel	9
National promotion policy	10
Organization	12
Inspection procedure	12

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CONTENTS (Con.)

Page

Procedure for preparing and distributing coal-mine inspection and investigation reports 15
Follow-up procedure 17
Regular inspection work accomplished 18
Special work accomplished 20
Coal-Mine Accident-Prevention Course for Miners 21
Coal-Mine Accident-Prevention Course for Supervisors 21
Electrical Safety Course 22
The Holmes Safety Association 22
Investigation of fatal coal-mine accidents 22
Roof-control work 23
Coal-Mine-Haulage Safety Course 25
Injury and employment data 25
Ventilation surveys 25
Explosives surveys 25
Electrical surveys 25
Dust surveys 26
Research to minimize hydraulic-fluid fire hazards 26
Fire-resistant trailing cables 27
Safety standards 27
Study of natural-gas restorage areas in coalfields 27
Participation in safety organizations 27
Cooperation with other Federal agencies 27
Revision of State coal-mining laws 28
First-aid and mine rescue training 28
Miscellaneous special assignments 28
Achievements 29
Need for legislative action 30
Publications 30
Appendix A 31
Table 1. - Personnel of Division of Coal-Mine Inspection as of December 31, 1956, and coal area covered by each field office 31
Table 2. - Distribution of coal-mine inspectors and electrical inspectors, December 31, 1956 41
Table 3. - Distribution of engineers, December 31, 1956 ... 42
Appendix B 43
Table 1. - Details of inspection data, Title II mines, 1956 43
Table 2. - Withdrawal orders issued under sec. 203(a) for imminent dangers, by States, July 16, 1952-December 31, 1956 44
Table 3. - Withdrawal orders issued under sec. 203(c) for failure to abate violations of sec. 209, by States, July 16, 1952-December 31, 1956 45
Appendix C 46
Appeals to Director on which hearings were necessary under sec. 206(c) and appeals to Federal Coal Mine Safety Board of Review under sec. 207, July 16, 1952-December 31, 1956 46

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CONTENTS (Con.)

	Page
Appendix D	48
Table 1. - Number of active coal mines in the Nation, 1956	48
Table 2. - Number of regular inspections, surveys, and miscellaneous investigations and inspections	49
Table 3. - Mines inspected, regular inspections, and average inspection per active mine, 1956	50
Table 4. - Average man-days to complete regular inspections and reports	51
Table 5. - Special inspections and average total man-days to complete an inspection, Title II mines, 1956	52
Table 6. - Comparative inspection data, Title II mines, 1953-56	52
Appendix E	53
Violations of Federal Mine Safety Codes	53
Appendix F	54
Violations of Federal Mine Safety Codes abated during inspections	54
Appendix G	55
Table 1. - Title I mines at which no violations of the Federal Mine Safety Codes were observed during an inspection	55
Table 2. - Title II mines at which no violations of the Federal Mine Safety Codes were observed during an inspection	56
Table 3. - Title II mines at which no imminent dangers (sec. 203(a)) or violations of sec. 209 under Title II were observed during an inspection	58
Appendix H	66
Safety-education training of mine personnel, 1956	66
Appendix I	67
Miscellaneous special assignments	67
Appendix J	68
Table 1. - Number of injuries and rates per million man-hours exposure (portal to portal)	68
Table 2. - Number of fatal and nonfatal injuries and injuries per million man-hours exposure, portal to portal, in coal mines of the United States	68
Table 3. - Major coal-mine disasters in the United States and number of persons killed	69
Table 4. - Underground fatality experience in the coal industry, Titles I and II mines	69

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SUMMARY

A brief resume follows of some recent activities of the Division of Coal-Mine Inspection that have had a favorable effect on health, safety, and the reduction of injuries at coal mines:

1. The Federal Mine Safety Code for Bituminous-Coal and Lignite Mines of the United States was issued originally by the Director of the Bureau of Mines on July 24, 1946, after consultation with management and labor representatives of the coal-mining industry. The code has been used by Federal coal-mine inspectors during their inspections of bituminous-coal and lignite mines as a basis for determining the existence of unhealthful and unsafe conditions and practices in these mines. A revised code was issued by the Secretary of the Interior October 8, 1953, following further consultations with representatives of management and mine workers, and was incorporated by reference in the 1952 and subsequent bituminous-coal wage agreements. The agreement of May 29, 1946, between the Secretary of the Interior, acting as Coal Mines Administrator under authority of Executive Order 9728, and the United Mine Workers of America, covering bituminous-coal and lignite mines in Government possession, charged Federal coal-mine inspectors with the responsibility of making periodic investigations of the mines and reporting to the Coal Mines Administrator any violations of the Federal Mine Safety Code. The inspectors were active in making prompt investigations of hazardous mines that had been closed by order of the Coal Mines Administrator to determine if enough improvements had been made to allow the mines to reopen. Federal coal-mine inspectors also had temporary authority to close mines they found to be imminently dangerous, but such authority (under Executive Order 9728) was removed on June 30, 1947, when Government control of the mines was terminated.

2. The Safety Standards for Anthracite Mines were prepared by personnel of the Bureau of Mines and have been used by Federal coal-mine inspectors as a basis for determining unhealthful and unsafe conditions and practices during their inspections of the Pennsylvania anthracite mines. These standards were revised and issued on October 14, 1953, by the Secretary of the Interior as the Federal Mine Safety Code for Anthracite Mines of the United States.

3. Public Law 328 (ch. 450, 80th Congress, 1st sess.), effective for 1 year after its approval (Aug. 4, 1947), required the Secretary of the Interior, acting through the Director of the Bureau of Mines, to submit quarterly reports to the Congress of the United States on the condition of all bituminous-coal and lignite mines inspected by the Federal coal-mine inspectors, all recommendations and notifications sent to State agencies, and action taken by mine owners, operators, and State agencies on the findings and recommendations.

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4. In response to letters from the Secretary of the Interior to the Governors of coal-producing States and personal contacts by field personnel, State-participation plans for joint State-Federal coal-mine inspections (provided for under sec. 202(b), Title II, Federal Coal Mine Safety Act) have been approved and are in effect in Alaska, North Carolina, North Dakota, Oklahoma, Washington, and Wyoming.

5. There were approximately 9,458 active coal mines in the United States in 1956. Since Public Law 49 became effective in May 1941, 93,143 regular Federal inspections of coal mines have been made, 10,754 of these during 1956.

6. The revised Coal-Mine Accident-Prevention Course for Miners was introduced in the coal-mining industry by the Bureau of Mines on January 1, 1947. Since then, 160,760 mine workers have completed the training, including 3,212 in special on-the-job classes, conducted by Division of Coal-Mine Inspection personnel assigned temporarily to educational work. In addition, thousands of mine workers have been given specialized training in the maintenance, use, and limitations of permissible flame safety lamps to qualify them to test for gas in accordance with the provisions of sec. 209(d) (9) of the Federal Coal Mine Safety Act.

7. The revised Coal-Mine Accident-Prevention Course for Supervisors was introduced in the coal-mining industry by the Bureau of Mines March 1, 1948. Since then, 19,514 supervisors and those aspiring to official positions have completed this training conducted by personnel of the Division of Coal-Mine Inspection.

8. A course to train coal-mine electricians, technicians, and others in electrical safety was prepared in 1954; 171 have completed this training.

9. Organizational work is being continued to extend the benefits of The Holmes Safety Association.

10. Federal coal-mine inspectors began investigating all coal-mine fatalities on February 10, 1950. The reports of the investigations are made available to the industry; they are summarized and published annually, with the hope that the information will help to prevent accidents in coal mines.

11. The bolting method of roof control, introduced into the coal-mining industry by the Bureau of Mines in 1948, is a major contribution toward reducing coal-mine accidents. The success of the new method of roof control shows that it is likely to surpass the use of rock dust in preventing loss of life and serious injuries in coal mines. Certain mining engineers and coal-mine inspectors have been especially trained in mine-roof control and roof bolting; they advise mine operators whether bolting is practical in their mines and, if so, the proper plan of bolting to follow. About 35 percent of all bituminous-coal production in 1956 was mined under bolted roof.

12. To intensify the attack on roof-fall injuries, a program of research and investigation has been instituted by Bureau of Mines engineers to bind mine-roof strata in place to stabilize stratified rock. Efforts are being continued to interest manufacturers and users of mining equipment to develop canopies to protect face workmen against roof falls.

13. The introduction of roof bolting brought with it a health hazard from dusts produced during drilling in roof rock. The Bureau has been active in eliminating this hazard by cooperating with manufacturers of mining equipment in designing permissible dust collectors that may be used in lieu of water to allay the dust at its source. Bureau of Mines Schedule 25, Procedure for Testing Dust Collectors

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for Permissibility for Use in Connection With Rock Drilling in Coal Mines, became effective January 23, 1952 (amended July 23, 1952). Numerous dust collectors have met the requirements and have been approved for use in coal mines under Schedule 25.

14. A short Coal-Mine Roof-Control Course, designed to impress mine officials and workmen with the need for more adequate roof-control measures and to make all concerned more roof-control conscious, was initiated by the Bureau of Mines on May 1, 1951. The course is very popular and to December 31, 1956, had been completed by 469,568 persons.

15. A short Coal-Mine-Haulage Safety Course was introduced in the coal-mining industry on April 1, 1951, by the Bureau of Mines; subsequent to that date, 161,867 haulage employees and others have completed the training conducted by Federal coal-mine inspectors.

16. Other special studies covering roof control, explosives, gases (including restorage of natural gas beneath coal measures), fires, explosions, mining, electricity, haulage, ventilation, rock dusting, and control of atmospheric dusts are being made continually as part of the health and safety program set up under the Federal Coal Mine Safety Act. Findings and recommendations are made available to the coal-mining industry.

17. Research is being continued to determine what procedure the Bureau should follow to develop economical, nonflammable hydraulic fluids for coal-mine equipment to eliminate the use of hazardous flammable fluids.

18. Research initiated in 1955 is being continued to develop a fire-resistant insulation for electric cables.

19. Standards for minimum fire-fighting equipment for coal mines have been approved and will be published in the Federal Register.

20. Personnel of the Division of Coal-Mine Inspection is active in national, regional, and local safety organizations throughout the coal-mining areas.

21. Coal-mine inspectors and engineers of the division have accepted foreign assignments at the request of other Federal agencies. Those agencies acquire the technical knowledge and wide experience of the Bureau experts, and, in turn, the assignees have the opportunity to add to their fund of knowledge. The pertinent information obtained is made available to the mining industry in this country. One engineer is now on special assignment to Burma.

22. The Division of Coal-Mine Inspection has entered into a cooperative agreement with the Wage and Hour and Public Contracts Divisions, United States Department of Labor, whereby the Bureau of Mines field office informs the regional office of the Wage and Hour and Public Contracts Divisions of hazards in mines that are not covered by the mandatory provisions of Title II but are under contract to furnish coal to the Federal Government. The operators of such mines face cancellation of Government contracts if the hazards are not eliminated promptly.

23. The overall trend of coal-mine accidents has been favorable since the advent of Federal coal-mine inspection. The industry experienced no major disaster (five or more persons killed) in 1956.

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Health and safety conditions in coal mines in the United States have improved steadily since the institution of Federal coal-mine inspections. However, the frequency of roof-fall fatalities and minor mine fires and gas or dust ignitions indicates that much remains to be done before the conditions in many mines can be considered even fairly satisfactory.

The enactment of the Federal Coal-Mine Safety Act July 16, 1952, affords limited enforcement powers under Title II to the Federal coal-mine inspectors with respect to certain safety provisions that might cause or lead to a major disaster in underground mines that regularly employ 15 or more individuals underground. However, the act prescribes no mandatory provisions nor is it designed to prevent the day-to-day accidents that result in more than 90 percent of the coal-mine fatalities or to prevent accidents in mines (which, as a group, usually have high accident-frequency rates) that employ regularly less than 15 men underground. This large field is left to the cooperative efforts of the Federal Bureau of Mines, State agencies, employers, and employees. The enforcement of rules and regulations concerned with day-to-day accidents, safety, health, and welfare is clearly left to the jurisdiction of the several States.

There is no doubt that much more can be accomplished if the mandatory safety provisions of the act are extended to cover mines (which, as a group, are poorly regulated) that employ regularly less than 15 individuals underground. This is borne out by the fact that the fatality-frequency rate per million man-hours exposure in undergrount Title I mines in 1956 was 2.84, compared with a frequency of 1.18 for underground fatalities at Title II mines.

INTRODUCTION

This report covers the calendar year 1956 and has been transmitted by the Secretary of the Interior to the Congress of the United States in accordance with the provisions of secs. 106(a) and 212(c) of the Federal Coal Mine Safety Act (66 Stat. 692; 30 U. S. C., secs. 451-483).

Background

The Federal coal-mine inspection program was established to carry out the provisions of Public Law 49, 77th Congress, H. R. 2082, approved May 7, 1941. The act has been amended since to be known as Title I, Advisory Powers Relating to Health and Safety Conditions in Mines under Public Law 552, 82d Congress, approved July 16, 1952, which also includes Title II, Prevention of Major Disasters in Mines. Public Law 552 is known as the Federal Coal-Mine Safety Act.

Congress passed the act as a result of public indignation and demand for enforcement powers for Federal coal-mine inspectors following a series of seven appalling major coal-mine disasters that occurred between January 18, 1951, and March 27, 1952.

Under the provisions of Title I, the Secretary of the Interior, acting through the Federal Bureau of Mines, is authorized and empowered to make, or cause to be made, annual or necessary inspections and investigations in coal mines, the products of which regularly enter commerce or the operations of which substantially affect commerce. The principal functions of the Federal coal-mine inspectors under Title I are to determine the causes of accidents and occupational diseases in coal mines and to endeavor to eliminate or ameliorate them (1) by revealing, through personal conferences with mine personnel, correspondence, and published reports, the unhealthful and unsafe conditions and practices existing in the mines

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and (2) by recommending practical means for correcting the conditions observed. Title I does not provide enforcement powers, and compliance with the recommendations of the inspectors is not mandatory under its provision. It does give Federal coal-mine inspectors the right to enter coal mines for inspection purposes.

Title I further authorizes and directs the Secretary of the Interior, acting through the Bureau of Mines, to expend the funds made available to him for advancing health and safety in coal mines and for preventing or relieving accidents or occupational diseases therein, in such lawful manner as he may deem most effective in the light of information obtained to promote the accomplishment of the objectives for which the funds are granted. To comply with the directive, the personnel of the Division of Coal-Mine Inspection is conducting nationwide safety-education programs for coal-mine officials and workmen. In addition, special studies are made of mine health and safety problems relating to roof control, haulage, ventilation, mine disasters, dusts, explosives, gases, electricity, etc.; the results of the studies and the improved methods determined from them are made available to the mining industry and general public through published reports.

The Federal Mine Safety Code for Bituminous-Coal and Lignite Mines - used by Federal coal-mine inspectors as the basis for determining the existence of unhealthful conditions and practices in these mines - has been adopted and incorporated by reference in the current National Bituminous-Coal Wage Agreement between the United Mine Workers of America and the bituminous-coal operators. The operator is required under this agreement to comply promptly with the recommendations made to correct violations of the code; the agreement also establishes a Joint Board of Review to which either party to the contract may appeal if it feels that the recommendations would cause irreparable damage or great injustice.

The current Anthracite Wage Agreement between the United Mine Workers of America and the anthracite operators accepts the Federal Mine Safety Code for Anthracite Mines, subject to the right of review by the Director of the Federal Bureau of Mines upon petition from either party to the agreement.

Title II of the Federal Coal Mine Safety Act is designed to prevent major disasters in mines whose products regularly enter interstate or foreign commerce or whose operations substantially affect such commerce. Compliance with its safety provisions is mandatory; however, Title II applies only to coal mines in which 15 or more individuals are employed regularly underground. To accomplish compliance, Title II requires that the Director of the Bureau of Mines shall cause an inspection of each such mine to be made at least annually to determine whether an imminent danger, as described in sec. 203(a), exists, whether any provision of the Mine Safety Provisions of sec. 209 is being violated, or whether any such mine is a gassy mine as prescribed in sec. 203(d). It further provides that the Director shall make or cause to be made such special inspections of Title II mines as may be required by secs. 203(c) and 206 and any other inspections of such mines as he deems necessary for the proper administration of Title II. Provision also has been made for joint inspections of mines with representatives of the inspection agency of any State that desires to cooperate and submits a suitable plan for participation.

The Advisory Committee

Sec. 108 of Title I provides for the appointment of an Advisory Committee composed of not more than six members to exercise consultative functions, when required by the Secretary of the Interior, in connection with the administration of Title I. The members of the present Advisory Committee are:

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Thomas Kennedy, Vice President, United Mine Workers of America, Washington, D. C.

W. A. Boyle, Assistant to the President, United Mine Workers of America, Washington, D. C.

Charles Ferguson, Director, Safety Division, United Mine Workers of America, Washington, D. C.

L. C. Campbell, Vice President, Eastern Gas & Fuel Associates, Coal Division, Pittsburgh, Pa.

Moss Patterson, Vice President, West Kentucky Coal Co., Madisonville, Ky.

J. M. Reid, Vice President, The Hudson Coal Co., Scranton, Pa.

Committee meetings were held in Pittsburgh, Pa., on December 3, 1941; and in Washington, D. C., on September 3, 1941, May 12, 1942, November 5, 1942, January 28, 1946, and October 3, 1950.

EMPLOYMENT OF PERSONNEL

Coal-mine inspectors, electrical inspectors, and engineers of the Division of Coal-Mine Inspection are selected from the Civil Service register, and applicants must meet the rigid requirements of the United States Civil Service Commission before their names can be included in the register. On July 19, 1954, the register was closed against the acceptance of additional applications.

Current requirements for the several grades of Federal coal-mine inspectors are as follows:

United States Civil Service Commission Requirements for Federal Coal-Mine Inspectors

Written Description of Some Phase of Coal Mining

Applicants must submit with their application a 300-word description of some phase of coal mining, such as the ventilating system, haulage system, or timbering methods used in a mine familiar to the applicant. The description must be prepared by the applicant, and he must certify in his own handwriting that he received no assistance in composing it. Applicants who fail to submit this written description, or who submit an unsatisfactory one, or who submit statements copied from texts or other sources of which they are not the authors will receive no further consideration under this announcement.

Experience

Applicants must show, as a minimum, the quality and amount of experience prescribed hereafter, unless they substitute education for experience (see "Substitution of Education for Experience" following). To establish eligibility in any grade, at least one year of the required experience for that grade must have been acquired during the four years immediately preceding the date of filing application.

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GS-9, $5,440. - Six years of progressive experience in practical coal mining; of which at least two years must have been specialized experience in coal-mining operations of medium size which involved responsibility for providing adequate safety and health programs in a position of at least the responsibility required of a mine superintendent, mine foreman, mining engineer, or safety inspector. The nature of the experience must have been broader than that of a fire boss, mine examiner, or section foreman and must have demonstrated the ability to perform important coal-mine inspection work under general supervision.

GS-11, $6,390. - Seven years of progressive coal-mining experience; of which three or more years must have been specialized experience which required supervision of difficult, important, and responsible work, subject only to general supervision and review, in a position of at least the responsibility required of a mine superintendent, mine foreman, mining engineer, or safety engineer. The experience must have included the direction, application, and enforcement of modern coal-mine safety and health programs. This experience must also have demonstrated that the applicant has (1) a thorough knowledge of the basic principles applicable to modern programs for promotion of safety and health in coal mines; (2) the resourcefulness, initiative, and ability to perform, direct, and coordinate moderately large-scale mine inspection work of considerable difficulty; and (3) administrative ability, tact, and judgment necessary in promotion of programs for improved safety, health, and working conditions in coal mines and in the application of mine safety regulations.

GS-12, $7,570. - Eight years of progressive experience in various operations necessary in development and production in coal mines, including at least four years of difficult, important, and responsible specialized work, which was subject only to a general administrative supervision, in a capacity such as direct supervisor. This work must have included full responsibility for direction and application of modern coal-mine safety and health programs. This experience must have demonstrated that the applicant has (1) a thorough knowledge of the basic principles applicable in modern programs for promotion of health and safety in coal mines; (2) the resourcefulness, initiative, and ability required in a position of at least the responsibility of mine manager, mine superintendent, mining engineer, or safety engineer; (3) the ability to perform, direct, and coordinate large-scale mine inspection work of unusual difficulty; and (4) administrative ability of a high order along with the tact and judgment necessary to administer safety regulations and to conduct important conferences with interested parties, such as coal-mine operators, labor organizations, and the general public on matters related to safety and health of workers engaged in coal-mining operations.

Provisions of Law

Section 109 of the Federal Coal Mine Safety Act, under which these positions are established, provides:

> That in the selection of persons for appointment as coal-mine inspectors no person shall be so selected unless he has the basic qualification of at least 5 years practical experience in the mining of coal, and is recognized by the United States Bureau of Mines as having the training or experience of a practical mining engineer in those essentials necessary for competent coal-mine inspection.

The provision of law quoted above are made a part of the requirements of this examination. Persons whose qualifications are not such as to receive the recognition of the United States Bureau of Mines as required by law cannot be accorded an

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eligible rating in this examination. The nature of each applicant's experience and the required degree of ability will be carefully determined before eligibility and rating are decided. Experience will be evaluated on the type, size, and difficulty of operation in mines in which the applicant has had supervisory responsibility.

Substitution of Education for Experience

Successfully completed course of study in engineering at an accredited college or university may be substituted for part of the required general experience on the basis of one year of education for six months of experience. Such substitution will be limited to one year of required general experience in GS-9 grade and two years of required general experience in the GS-11 and GS-12 grades. In each case, however, the applicant must show the total required amount of specialized experience.

The successful completion of college work in nonaccredited institutions will be accepted on the same basis as indicated for accredited colleges under the requirements for the position, provided that such institutions give instruction of definitely collegiate level and that the State university of the State in which the institution is located accepts the courses and gives advanced credit for them. (In those States where there is no State university, the evaluation and acceptance of college credits as made by the State department of education will be accepted.)

Ability to Drive Automobiles

Applicants must give evidence that they can operate an automobile. Possession of a valid automobile operator's license in the State of legal residence of an applicant will be accepted as evidence.

Citizenship

Applicants must be citizens of or owe allegiance to the United States.

Physical Abilities

Applicants must be physically capable of performing efficiently the arduous duties of this position. They must be free of such defects or diseases as may constitute employment hazard to themselves, or endanger fellow employees or others. They must be capable of sustained physical exertion for periods of six to eight hours per day under such hazardous conditions, as traveling over rock falls, on steep pitches, in adverse atmospheric conditions, and under low roof where it is frequently necessary to crawl on the hands and knees. Inspectors entering a mine to make an inspection normally carry equipment which weighs up to 20 pounds. In emergencies following a mine disaster, they may be required to work for several two-hour periods a day carrying mine rescue apparatus which weighs about 40 pounds. Arms and legs must be sufficiently intact and functioning to permit the applicant to perform the duties described above. Vision must be at least 20/50 Snellen in one eye and 20/70 in the other, without glasses. The ability to distinguish basic color is essential. Hearing, with or without a hearing aid, must be sufficiently acute to enable the applicant to hear ordinary conversation at 20 feet. These standards must be met by all applicants; however, certain requirements may be waived for veterans who can demonstrate ability to perform the duties efficiently and safely.

In view of the strenous physical exertion required for this position, hernia (whether or not supported by truss), organic heart disease (whether or not

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compensated), varicose veins (unless slight), serious deformities or disabilities of extremities (including weak feet), mental or nervous disease, chronic respiratory or chronic constitutional disease, or other physical defect which would cause the applicant to be a hazard to himself, or to others, or which would prevent efficient performance of the duties of the position, will disqualify him for appointment.

Applicants will be required to submit a certificate of physical examination upon request; a check physical examination will be made by a Federal medical officer before the oath of office will be administered at the first post of duty. Persons who are offered appointment must pay their own expenses in reporting for duty. If, upon reporting at the place of assignment, they are found to be ineligible because of physical defects, they cannot be appointed and no part of their expenses in returning home can be paid by the Government.

Basis of Ratings

No written test is now required. Applicants' qualifications are rated on a scale of 100 and judged from a review of their experience, education, and training and on corroborative evidence. Applicants may be required to present proof of qualifications claimed but should not submit such proof unless it is requested. Exaggeration or misstatement or the submission of a sample of written work which is not the applicant's own will be cause for disqualification or dismissal from the service.

As previously stated, the last examination for Federal coal-mine inspector was closed in 1954. However, it is expected that the Civil Service Commission will announce an assembled examination for Federal coal-mine inspector during the latter part of calendar year 1957.

United States Civil Service Commission
Basic Requirements for Mining Engineers

Applicants for the position of mining engineer must have completed successfully a full four-year professional curriculum leading to a bachelor's degree in an accredited college or university or have had four years of successful and progressive experience in technical engineering comparable to that which would have been acquired through successful completion of a full four-year engineering curriculum in an accredited college or university.

Tentative Selection and Probational Appointment

After a coal-mine inspector or engineer has been selected from the Civil Service register for possible employment, he is interviewed by a Bureau of Mines official to determine his fitness for the position. If the interview discloses that the applicant is unsuitable for employment, he no longer is considered for the position. If the applicant is considered favorably and has passed the required medical examination, he is given a probational appointment for 1-year. Probationers who do not meet Bureau of Mines standards are separated from the service in accordance with Civil Service regulations.

TRAINING OF PERSONNEL

Inspectors and engineers usually are given a 4-week course of intensive training in technical matters and Bureau policy at the Bureau of Mines Central Experiment Station, Pittsburgh, Pa., before being assigned to field headquarters. In those

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instances when a new inspector is employed to replace an inspector who has left the service, the new inspector is given on-the-job training first by accompanying experienced inspectors, then he completes the 4-week training course at Pittsburgh when enough replacements are employed to constitute a class.

The classwork includes lectures, demonstrations, and laboratory work on such vital subjects as roof control, haulage, mine rescue training, first-aid training, causes and prevention of mine fires and explosions, mine gases and methods of detection and control, mine electricity, ventilation, and explosives; methods of collecting and analyzing dust and air samples, conducting a coal-mine inspection, and preparing inspection and investigation reports; operating an automobile, and general policy.

A new inspector is required to accompany experienced inspectors until he has demonstrated his ability and is authorized by the Director to conduct inspections without immediate supervision. He is admonished to go slowly with his first inspection - to be very careful and thorough so that hazards are not overlooked. The need for thoroughness is emphasized throughout the training period and reemphasized from time to time thereafter, so that Bureau policy is not misunderstood.

One or more coal-mine inspectors of outstanding ability are assigned in certain field offices to assist the field officials in supervising the coal-mine inspectors under their jurisdiction. The supervising inspectors accompany the regular inspectors, instruct them when necessary to improve the quality of their work, and submit reports of their observations for critical review and appropriate action.

Coal-mine inspectors and engineers are required from time to time to teach the Bureau accident-prevention courses, to address meetings of persons interested in mine safety, and to confer with groups of mining men - all for the purpose of "selling" safety. To assure that the inspectors and engineers are well equipped to perform these duties effectively, most of them have been given a short course of instruction in the conference method of teaching by a nationally known authority on vocational industrial training.

NATIONAL PROMOTION POLICY

A new National Promotion Policy for Federal Coal Mine Inspectors was approved and became effective January 1, 1955. It provides in part as follows:

Policy on grades of coal-mine-inspection personnel:

Grade GS-13 is usually associated with managing a subdistrict office covering a very large geographic area (one or more States) in which there is scattered coal mining or a small area in which coal-mining activity and the complexities of operation are concentrated to the extent that it is necessary to impose responsibilities and complexities of management on a supervisor equivalent to that intended by classification standards for grade GS-13. There are exceptions to this, in that some highly specialized jobs not involving management of offices or employees are classified to grade GS-13.

Grade GS-12 is associated with minor management responsibilities, with corresponding reduction in supervision, management, and specialized technical assignments of difficult and complicated nature requiring exercise of above-average judgment and tact.

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Grade GS-11 is considered the journeyman grade for coal-mine inspection, with closer supervision and more limited exercise of independent judgment.

Grade GS-9 is considered the apprentice grade for coal-mine inspection. Covers inspections with inspectors of higher grades and inspections of the least difficult mines without immediate supervision as part of the inspector-training program.

It is the established policy that additions to the coal-mine inspection staff shall be made in grade GS-9, and that it is the responsibility of the District Supervisor to provide training and supervision for inspectors in grade GS-9, particularly during the probationary or trial period, necessary to develop and train those individuals and prepare them for journeyman status. The District Supervisor shall subject those individuals to appropriate tests to determine their proficiency. On full proof of an inspector's ability to assume journeyman status, the District Supervisor shall so certify with recapitulation of evidence in support of his finding. After approval by the Assistant Director - Health and Safety, the personnel office having jurisdiction shall proceed with promotion of the individual to grade GS-11 at the then place of employment if the inspector is already doing or is to be immediately assigned in that area for a considerable portion of time to the kind of inspection work classifiable to grade GS-11 subject to limitations inherent in law and regulation. Promotions made other than by certification from the register shall be reported monthly to the Chief Personnel Officer so that the register may be kept current.

It is the policy that the number of positions in each grade shall be flexible and determined by the exigencies of the work as it expands or contracts with changes in the industry, or in the goals set within the Bureau. A system for promotion from grade GS-9 to GS-11 and GS-11 to GS-12 is provided hereinafter.

Inasmuch as the work and responsibilities of grade GS-13 positions require exercise of judgment, tact, initiative, and other special qualifications not practical for measurement by a fixed formula, such as is used for the promotion register, positions in grade GS-13 shall be filled only on the basis of selection by joint action of officials in higher echelons.

It is the policy that coal-mine inspection positions shall be occupied only by men who are physically fit to perform at any time the rigorous work involved. To insure compliance with this policy it shall be the duty of each District Supervisor to see that each coal-mine inspector is given a full physical examination at Federal expense at intervals of not more than five years, preferably three years after age 60, or more frequent if considered necessary. This examination shall include full-plate chest X-ray and electrocardiogram and shall be concluded with a statement by the examining physician as to the man's ability to perform the arduous work of a coal-mine inspector. If an inspector is not able to perform such arduous work, the District Supervisor shall move through appropriate channels for disability retirement of the individual or other corrective measures. This procedure shall be applied to all persons whose

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job title is Coal Mine Inspector in grades GS-9, GS-11, GS-12, and GS-13 and all other coal mine inspection personnel, regardless of grade or title, whose position requires that they perform such arduous work.

ORGANIZATION

The Congress appropriated $3,874,300 to carry on the work of the Division of Coal-Mine Inspection during the fiscal year 1957.

The coal-mine inspectors, electrical inspectors, and engineers of the division are headquartered at strategic places in the coal-producing areas in the United States. A list of field personnel, by headquarters, as of December 31, 1956, is given in appendix A, table 1; and summaries of coal-mine inspectors, electrical inspectors, and engineers, by headquarters and grades, as of the same date are given in appendix A, tables 2 and 3.

Reorganization of the health and safety activities of the Bureau of Mines, on the basis of a report by a survey team from private industry, appointed by the Secretary of the Interior, became effective December 19, 1954, in accordance with Administrative Order 695, issued by the Director of the Bureau of Mines on December 8, 1954.

INSPECTION PROCEDURE

The Federal Mine Safety Codes are used as the bases for determining unsafe and unhealthy conditions and practices in all coal mines inspected, and the safety provisions of Title II, Federal Coal Mine Safety Act, are mandatory at all coal mines that regularly employ 15 or more individuals underground.

Briefly, the standard procedure for inspecting all coal mines (under Titles I and II), is as follows: Generally, neither the mine operators nor the miners are notified of an impending inspection. A regular inspection may require 1 day or several weeks, depending on the size of the mine, the thickness and pitch of the coal beds, the system of mining, the degree of concentration of working places, the prevalence of hazardous conditions and practices, and other conditions. The inspector is required (a) to inspect every working place in the mine, all active haulageways, entrances to abandoned workings, accessible old workings, airways, traveling ways, escapeways, and any other place where a dangerous condition might exist, electric equipment and installations, haulage facilities, first-aid equipment, ventilation facilities, communication installations, roof and rib conditions, blasting practices, surface plant, etc. He also is required (b) to test for gas and for oxygen deficiency in all mines and to collect samples of mine air and mine dusts for chemical analysis, if necessary, to determine precisely the conditions with respect to noxious and explosive gases, oxygen content, and coal dust and rock dust.

In multiple-shift operations the inspector is required to devote part of his time to inspection during each shift so that hazards are not overlooked inadvertently and to spend enough time at the active working faces to observe, wherever practicable, a complete cycle of operations, including cutting, drilling, blasting, loading, hauling, roof support, etc.

In addition, unannounced "spot-check" inspections are made between regular inspections of certain mines where experience indicates lack of sincere endeavor by the operator to comply with accepted safety standards between inspections.

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To assure that the principle of States' rights is observed, Title II provides for joint Federal-State inspections when a State desires to cooperate in the activity. The Director of the Bureau of Mines is required by the act to cooperate with official mine-inspection or safety agencies of the coal-producing States. Title II provides further that any State desiring to cooperate in joint inspections may submit a State plan for executing the purposes of this part of the act. Such a plan shall designate an authorized State safety or inspection agency to administer the plan and give assurance that the agency will employ an adequate and competent staff of inspectors, assign its inspectors to participate in inspections in the State under Title II, and submit reports to the Director of the Bureau of Mines as he may require. The Director is required to approve any State plan that complies with the provisions of Title II. The Director may withdraw his approval and declare such a plan inoperative if he finds that the State agency is not complying with the spirit and intent of the State plan.

If a State plan has not been adopted, the Federal coal-mine inspector is responsible under Title II to take 1 of 2 courses of action if he finds certain hazardous conditions during an inspection:

1. The first action involves imminent danger: If a Federal inspector finds danger that a mine explosion, mine fire, mine inundation, or man-trip or man-hoist accident will occur in a mine immediately or before the imminence of such danger can be eliminated, he issues a written order requiring the operator of the mine to cause all persons, except certain public officials and those specifically permitted by law to correct the conditions, to be withdrawn and debarred from entering the area described in the order. The operator is not permitted to resume normal operations in such an area until:

(a) The conditions specified in the order are corrected to the satisfaction of three duly authorized representatives of the Bureau of Mines appointed by the Director after receiving an application from the operator for annulment or revision of such order, and the order has been annulled or revised by the Director, or

(b) The Federal Coal Mine Safety Board of Review finds that, after receiving an application from the operator for annulment or revision of the order and after a formal hearing, the condition described in the order was erroneous or no longer exists.

2. The second action involves one or more violations of the Mine Safety Provisions of sec. 209: If a Federal inspector finds that any such mine-safety provision is being violated and that the violation does not cause danger that an explosion, fire, inundation, or man-trip or man-hoist accident will occur in such mine immediately or before the imminence of such danger can be eliminated, he is required to issue a written notice to the operator, giving the operator a reasonable time to correct the violation. If, upon making his special inspection to determine whether the violation has been abated in the time originally specified, the Federal inspector finds that the violation has been abated, he issues another written notice to that effect. If the inspector finds that the operator should be given additional time to abate the violation, he grants an extension of time in writing. If, however, the violation is not abated and the Federal inspector finds that circumstances, such as obvious lack of effort by the operator to correct the condition, do not justify

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granting an extension of time, he issues a written order requiring the operator to cause all persons, except certain public officials and those specifically permitted by law to correct the conditions, to be withdrawn and debarred from entering the area described in the order. Here again, the operator is prohibited from resuming normal operations in the affected area until the order is annulled or revised by the Director of the Bureau of Mines or by the Federal Coal Mine Safety Board of Review under the same procedure as described for imminent dangers. Any final order by the Board is subject to judicial review by the United States Court of Appeals for the circuit in which the mine affected is located, upon notice of appeal by the Director or the operator.

If a State plan has been adopted, no mine shall be inspected by a representative of the Bureau under Title II unless a State inspector participates in the inspection in accordance with the plan, except where, in the Director's judgment, an imminent danger is deemed to exist and participation by a State inspector would unreasonably delay such inspection. If a Federal inspector issues a withdrawal order citing an imminent danger under sec. 203(a), and a State inspector did not participate in the inspection on which the order is based, the mine operator may request the State agency to assign an inspector to inspect the mine, and the request must be complied with promptly.

Title II further provides that no withdrawal order shall be issued if an operator of a mine in a State in which a State plan is in effect fails to abate a violation of a mine-safety provision that does not present an imminent danger under sec. 203(a) at the expiration of the time originally set or extended for abatement unless a State inspector participated in the inspection and concurs in the order. If the State inspector does not concur in the order, the operator or the State or Bureau representative may request the chief judge of the United States District Court for the district in which the mine is located to appoint a qualified, independent inspector to inspect the mine. If after the inspection either the independent or the State inspector concurs in the order, it shall be issued.

Withdrawal orders issued to the operator of a mine where a State plan is effective are not subject to review by the Director but are subject to review by the Federal Coal Mine Safety Board of Review.

In response to requests, pertinent plans for State participation were drafted and submitted to Alabama, Arkansas, Kansas, Montana, North Carolina, Oklahoma, Washington, and Wyoming to guide the States in formulating plans to submit to the Director for his approval. On September 29, 1952, a plan submitted by Wyoming was the first to be approved by the Director. Since then, five more plans have been approved. The States that submitted a plan and the effective date of each plan are: Washington, December 17, 1952; Oklahoma, February 13, 1953; North Dakota, February 16, 1953; North Carolina, March 27, 1953; and Alaska, June 15, 1953. During 1956, 12 joint State-Federal inspections were made in Wyoming, 13 in Washington, 13 in Oklahoma, and 5 in Alaska - a total of 43. (See appendix B, table 1.)

Monthly conferences in which the Bureau participates jointly with safety directors of the coal-mine operators' and mine workers' organizations, headquartered in Washington, D. C., are held to discuss problems in coal-mine safety and consider suggestions and ideas for improving the Federal coal-mine inspection service. Proposed major changes in policy or interpretations of the safety provisions of the Federal Coal Mine Safety Act and Federal Mine Safety Codes are submitted to this group for consideration and comment. If after consideration, the

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Director approves the interpretations of the act, they are published in the Federal Register for the benefit of the industry. This cooperative effort has assisted materially in solving many problems that have been encountered.

Each coal-mine inspector is assigned a district comprising mines that he inspects regularly. This procedure, adopted in 1948, has developed greater personal interest of the inspector to have the mines under his jurisdiction in the safest condition possible. Every inspector is responsible for devising ways and means to reduce accidents in his district. To improve the effectiveness of his inspections, he is required:

a. To determine the outstanding causes of accidents at each mine to be inspected; this information is used as a guide to detect hazards during the inspection.

b. To discuss observed hazards and means of correcting them with the official accompanying him when the hazard is discovered, with the mine-safety committeemen when feasible, and with high company officials when a conference can be arranged.

c. To enlist the cooperation of labor, management, State inspection personnel, and all other safety-promotion agencies.

d. To become acquainted with management, the officials of the mine workers' organization, and the mine-safety committeemen.

e. To attend local union meetings occasionally to discuss safety with the members and endeavor to promote cooperation in accident-prevention work.

f. To participate in mining institutes, Holmes Safety Association chapters and councils, and other agencies dedicated to the promotion of mine safety.

g. To assume a personal interest and definite personal responsibility in preventing accidents.

h. To investigate all fatal coal-mine accidents, gas or dust ignitions, and mine fires in his district.

i. To assist in rescue, recovery, and investigative work following disasters.

j. To aid mine officials in improving operating methods, with a view toward greater efficiency, economy and safety.

k. To conduct first-aid and mine rescue training and officiate at first-aid and mine rescue contests.

PROCEDURE FOR PREPARING AND DISTRIBUTING COAL-MINE INSPECTION AND INVESTIGATION REPORTS

A preliminary report is prepared by the inspector, in accordance with standard regulations, following a regular inspection of a coal mine that employs less than 15 men underground only if hazards of primary importance are observed. Preliminary

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reports are not prepared for strip mines. Mines that employ less than 15 men underground and strip mines are hereafter called Title I mines.

The preliminary report, indicating unsafe conditions and practices considered of primary importance, is prepared and posted at the mine by the inspector within 1 day after completing the inspection. Typed copies of the preliminary report are distributed by the field offices of the Bureau of Mines to the mine officials, the State mine-inspection agency, the district and national offices of the mine workers' organization having jurisdiction at the mine, and the Washington office of the Federal Bureau of Mines, and to the Federal Geological Survey if the mine is on the public domain or Indian land.

Preliminary reports are not prepared after inspecting mines that employ regularly 15 or more individuals underground, hereafter called Title II mines. In lieu thereof, withdrawal orders, citing imminent dangers under sec. 203(a), or notices, citing violations of sec. 209 (Mine Safety Provisions) involving dangers that do not appear to be imminent, as provided under sec. 203(c), or an order classifying the mine gassy under sec. 203(d) is issued by the inspector to the mine operator during or after completing an inspection; copies are posted on the mine bulletin board. Typed copies of the notices or orders are distributed by the field offices of the Bureau of Mines to the mine officials and the agencies that would receive copies of the preliminary reports.

A final report on each inspection, prepared promptly by the inspector, contains a general description of the property and the conditions and practices observed during the inspection. Unsafe conditions and practices are recorded in detail, and recommendations are made to correct them. Where applicable, violations of the safety provisions of Title II that were observed during the inspection are cited, and the action taken by the inspector to have the violations abated is indicated. The results of the chemical analysis of dust and air samples collected during the inspection are given in the report to provide additional information on conditions at the mine.

Preliminary results of the experimental plan to improve compliance with the codes and the act between regular Federal inspections - by not citing in the Federal reports issued in 1956 violations that were corrected promptly after detection - appear to be favorable, and this plan is being extended tentatively through 1957.

Final reports on inspections of coal mines are prepared and mimeographed in the field offices and distributed from there to management, the State mine-inspection agency, the national and district offices of the mine workers' organization, the Joint Industry Safety Committee (bituminous-coal mines affiliated with the UMWA), and the Washington office of the Federal Bureau of Mines, and to the Federal Geological Survey if the mine is on the public domain or Indian land. Reports on mines that supply coal under Government contract are forwarded to the United States Department of Labor.

Enough reports are reviewed in the Washington office (after they have been transmitted to all concerned) to assure that the rules for preparing and distributing reports are being followed and to obtain information on serious hazards and violations of the safety provisions of the codes and the act.

Press releases on salient features of certain reports are issued by the Interior Department to the newspapers in the mine area.

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Posting and distributing the reports, issuing press releases and filing the reports in the Bureau of Mines field and departmental offices for public inspection constitute compliance with that part of the act requiring publication and dissemination of findings.

Reports are prepared on investigations of all fatal coal-mine accidents, major and minor coal-mine disasters, and mine fires and ignitions that are not of disaster proportions. They are distributed by the field offices to all agencies and persons that ordinarily would receive copies of the regular inspection reports.

FOLLOW-UP PROCEDURE

Under the mandatory provisions of Title II, special inspections are made by an inspector at the expiration of time periods set or extended as reasonable for abatement of violations of sec. 209, and, in instances where men have been withdrawn, upon orders from the Director of the Bureau, in response to a request from the operator, to determine whether the violations have been totally or partially abated.

The inspector may summarily issue an order to the operator to withdraw men from a mine or a portion of a mine if an imminent danger is deemed to exist or if the operator has not made a reasonable effort to abate a violation of sec. 209 at the expiration of the time that has been set or extended for abatement.

Sec. 205 provides for the creation of a Federal Coal Mine Safety Board of Review to hear and determine applications filed pursuant to sec. 207 for annulment or revision of orders made pursuant to secs. 203 or 206. In compliance with these provisions, the President, on August 21, 1952, appointed A. U. Miller, C. R. Ferguson, and J. G. Solari to serve as members of the first Board. Miller was named chairman. In 1953 E. R. Price, manager of coal properties, Inland Steel Co. (retired), was appointed to represent the operators in place of Solari (resigned); and Edward Steidle, Dean Emeritus, School of Mineral Industries, Pennsylvania State University (retired), replaced Miller as chairman. C. R. Ferguson, Director, Safety Division, UMWA, continues to serve as the representative of the coal-mine workers.

Sec. 206 provides that an operator may apply to the Director for annulment or revision of an order issued under sec. 203. However, where a State-participation plan is in effect, the application for annulment or revision of a withdrawal order must be directed to the Federal Coal Mine Safety Board of Review.

Sec. 208 provides that any final order issued by the board under sec. 207 shall be subject to judicial review by the United States Court of Appeals for the circuit in which the mine affected is located upon appeal by the Director or the operator; it provides further that the decision of a United States Court of Appeals is final and subject only to review by the Supreme Court.

Inasmuch as the Federal coal-mine inspectors have no authority to require compliance with their recommendations made under the provisions of Title I, every reasonable and practical effort is exerted to have these unsafe conditions and practices corrected. One method is to enlist the cooperation of the State mine-inspection agencies that generally have the authority to require the correction of hazards. When an inspector observes unduly hazardous conditions or practices that are not covered by Title II during the inspection of a mine, he informs the local mine officials. If prompt action is not taken to correct the hazards, he so advises the mine safety committeemen and the Bureau of Mines official in charge; the Bureau official promptly relays the information by telephone confirmed by letter, or by

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letter only, as the exigencies of the case indicate, to the State mine inspector and the head of the State mine-inspection agency. In addition, the statement of the hazard and the recommendation for its correction are capitalized for emphasis in the final report.

Such follow-up procedures undoubtedly have exerted considerable influence on improving practices and conditions in many mines and reducing coal-mine injury rates.

Seven of the 570 orders issued since the effective date of the act, requiring the withdrawal of men from underground areas, have been appealed to the Federal Coal Mine Safety Board of Review; three of these, issued under a State-participation plan, could not be appealed to the Director under the provisions of the act. In each instance where a withdrawal order has been issued and the operator has appealed to the Director of the Bureau of Mines, claiming that the dangerous condition has been corrected, Bureau action was prompt. The Bureau is as much interested as the operator in causing no undue delay in reopening a mine after violations of the law are corrected.

During the 54-month period (ended December 31, 1956) that the Federal Coal Mine Safety Act has been in effect, 15 applications for annulment of gassy-classification orders under sec. 203(d) were made to the Director; 11 applications were denied, and 4 orders were annulled. Five of the Director's decisions denying annulment were appealed to the Federal Coal Mine Safety Board of Review; 2 were upheld by the Board, 2 were reversed, and 1 decision limited the order to the area in which the air sample was collected. One application for annulment of a gassy classification order that was made directly to the Board was denied. Three withdrawal orders, issued under a State-participation plan in accordance with the provisions of sec. 203(a), citing imminent explosion dangers, were annulled by the Board after it was found that the dangers had been eliminated; the Board granted 2 appeals and denied another regarding orders issued under sec. 203(c); which were appealed directly to the Board; and the Board revised 1 withdrawal order, issued under sec. 203(c) for failure to abate violations of sec. 209(d)(9), by extending the time for abatement to permit training enough men in the maintenance, use, and limitations of permissible flame safety lamps to make the required tests for gas. At the request of the operator, the Bureau provided personnel for specialized training; at its completion the violation was abated, and and the Director annulled the order. Two adverse decisions by the Board were appealed by the Director to the United States Court of Appeals. One order,was affirmed annulling a gassy-classification order under sec. 203(d); the other, annulling an order under sec. 203(c), was dismissed because the appeal was not filed within the 30-day limit. (See appendix C.)

REGULAR INSPECTION WORK ACCOMPLISHED

According to a Bureau of Mines survey, 9,458 coal mines were operated more or less regularly during 1956. A tabulation showing the number of coal mines (by types and States) operated in 1956 is included in appendix D, table 1.

Performance data in appendix D reveal that:

(a) 10,754 regular inspections of coal mines were made during 1956;4/

(b) 93,143 regular inspections of coal mines have been made since Public Law 49 became effective in 1941;4/

4/ Table 2.

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(c) 5,331 of the 6,693 active coal mines employing less than 15 men underground (Title I mines) were inspected during 1956, and the average number of inspections per active small underground mine was 0.9;5/

(d) 1,511 of the 1,541 active coal mines employing 15 men or more underground (Title II mines) were inspected during 1956, and the average number of inspections per larger active underground mine was 2.4.5/

(e) 733 of the 1,224 active strip mines were inspected during 1956, and the average number of inspections per active strip mine was 0.7.5/

(f) The average time required to make a regular inspection and to prepare the inspection report, including travel time, was 1.6 days for strip mines, 1.5 days for Title I underground mines, and 4.3 days for Title II mines, excluding special inspections.6/ The average time needed to complete an inspection of a Title II mine, including special inspections, is 4.7 days.7/

(g) The 1,355 special inspections required under Title II were made to determine whether violations cited under sec. 203 had been abated. This averages 0.4 day for a special inspection and 0.4 additional man-day for each regular inspection of a Title II mine.7/

During 1956, Federal inspectors observed 105,434 violations of the Federal Mine Safety Codes while inspecting 5,331 Title I underground mines, an average of 20 violations per Title I underground mine inspected (see appendix E); only 7 percent of the violations observed were corrected during the inspections (see appendix F).

Federal inspectors reported 35,941 violations of the Federal Mine Safety Codes while inspecting 1,511 Title II mines, an average of 24 violations per Title II mine inspected (see appendix E); 36 percent of the violations were corrected during the inspections (see appendix F).

A total of 9,469 violations of the mandatory mine safety provisions of Title II of the Federal Coal Mine Safety Act was observed while making 3,648 inspections of these mines during 1956, an average of 2.6 violations per inspection; 8,031 (85 percent) of the violations were corrected promptly, and 1,389 original notices (form B) were issued at 512 mines granting reasonable time to abate violations that required more time to correct. Subsequent special inspections revealed that 1,415 violations had been abated, and 270 notices (form C) were issued granting additional time for abatement of others. About 95 percent of the violations (for which notices were posted) were abated at the expiration of the time originally set or at the end of the time extended. Forty-nine withdrawal orders, citing imminent dangers under sec. 203(a) (form A), were issued at 36 mines during 1956, making a total of 227 such orders issued at 145 mines since July 16, 1952 (see appendix B, tables 1 and 2, for imminent dangers cited by States); 47 withdrawal orders under sec. 203(c)

5/ Table 3. Owing to intermittent operation or abandonment, it was not possible to inspect some mines that operated part time during 1956.
6/ Table 4.
7/ Table 5.

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(form D) were issued at 19 mines during 1956 for failure to abate violations within a reasonable time, making a total of 343 such orders issued at 156 mines since July 16, 1952 (see appendix B, tables 1 and 3, for violations cited); and 9 orders (form B-1) were issued classifying mines gassy under sec. 203(d) during 1956, making a total of 108 such orders issued since July 16, 1952 (see appendix B). Comparative inspection data for 1953-56 are given in appendix D, table 6.

No violations of the Federal Mine Safety Codes were observed during inspection of 24 Title I underground mines and 84 Title II mines (see appendix E); no violations of sec. 209 of the Federal Coal Mine Safety Act were observed while inspecting 331 Title II mines (see appendix B); 33 of these mines were free of violations of the codes and the act. These mines are identified in appendix G, tables 1, 2, and 3.

The Federal Coal Mine Safety Act requires the Director to cause an inspection of each mine that is subject to the provisions of Title II to be made at least annually by a duly authorized representative of the Bureau. However, it is believed essential that most Title II mines be inspected at least three times a year by the Federal Government, that all small underground mines that are not covered by Title II be inspected at least once a year, that strip mines be inspected as time permits, and that spot-check inspections be made between regular inspections at mines where experience indicates lack of compliance with the provisions of the act. These minimum requirements are desirable because the provisions of Title I are purely recommendatory, and Title II provides no penalties for noncompliance with its mandatory requirements between inspections.

In addition to this mine-inspection schedule, a Federal inspector is required to perform special duties, such as investigating fatal accidents, serious nonfatal roof-fall accidents, and gas or dust ignitions and mine fires; making dust surveys; reviewing reports; working in supervisory capacities; assisting with rescue, recovery, and investigative work after mine disasters; teaching Bureau accident-prevention classes; organizing Holmes Safety Association chapters; and handling various other jobs. Special assignments are essential to comply with the provisions of the Federal Coal Mine Safety Act and to obtain the greatest benefits from regular inspection work.

SPECIAL WORK ACCOMPLISHED

Although the routine inspections of coal mines and the distribution of inspection reports are primary functions of personnel of the Division of Coal-Mine Inspection, it is realized that the effectiveness of an inspection is enhanced if the mine supervisory personnel and mine workmen have enough technologic and practical knowledge of modern concepts of coal-mine safety to recognize an unsafe condition or practice when it exists or is developing and know how to correct it. The opportunity to gain such knowledge from the Bureau of Mines was not available generally before 1947, principally because funds were not available for conducting the necessary training.

The need for specialized training in coal-mine safety is recognized in sec. 106 of the Federal Coal Mine Safety Act, which authorizes and directs the Secretary of the Interior, acting through the Bureau of Mines, to expend the funds made available to him for advancing health and safety in coal mines and for preventing or relieving accidents and occupational diseases in mines in such lawful manner as he may deem most effective in the light of the information obtained under the act to promote the accomplishment of the object for which such funds were granted.

To comply with this directive, the outstanding special accomplishments of 1956 are related herewith, and the miscellaneous special assignments are tabulated in appendix I of this report.

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Coal-Mine Accident-Prevention Course for Miners

The National Bituminous-Coal Wage Agreement provides that:

> At each mine there shall be a Mine Safety Committee selected by the local union. The Mine Safety Committee may inspect any mine development or equipment used in producing coal. If the Committee believes conditions found endanger the life and bodies of the mine workers, it shall report its findings and recommendations to management. In those special instances where the Committee believes an immediate danger exists and the Committee recommends that management remove all mine workers from the unsafe area, the operator is required to follow the recommendation of the Committee.

The Anthracite Wage Agreement provides that:

> Mine Committees, acting on the request of individual employees or upon their own personal knowledge, shall have the right to report to management unsafe conditions affecting operations or equipment. In such cases, the Mine Committee shall have the right, accompanied by representatives of management, to make necessary inspections of property or equipment for the ascertainment of actual facts. In the event such conditions, when reported, are not satisfactorily corrected, the Mine Committee shall request action by the State and Federal inspectors.

To assure that members of these committees are well informed of the provisions of the Federal Mine Safety Codes and thereby are better equipped to recognize unsafe conditions and practices that exist or are developing in mines and may learn the proper means of overcoming them, the Bureau of Mines, in cooperation with the United Mine Workers of America, inaugurated a Coal-Mine Accident-Prevention Course for Mine-Safety Committeemen in January 1947. The course covers the practical and some technical aspects of the modern principles of coal-mine safety and requires 20 hours of classroom instruction. Because it was so enthusiastically endorsed by mine-safety committeemen and mine operators, the training course was offered to all mine workmen, and the overall popularity of the training is attested by the record. From the time the revised training program was started on January 1, 1947, to December 31, 1956, 160,760 mine-safety committeemen and other mine personnel had completed the course. Of these, 3,212 men completed special on-the-job accident-prevention training - initiated at a large eastern coal mine in February 1952 (see appendix H for 1956 training). Usually the classes are conducted by Federal coal-mine inspectors who have been especially trained and are authorized to carry on instructional work.

In addition, 4,091 men received special training in the maintenance, use, and limitations of permissible flame safety lamps to qualify them to test for gas in places where electric machines are operated in face areas, in accordance with the provisions of sec. 209(d)(9) of the act (see appendix H for 1956 safety-education training).

Coal-Mine Accident-Prevention Course for Supervisors

The Bureau of Mines Coal-Mine Accident-Prevention Course for Supervisors requires 40 hours of classroom instruction and covers all technologic as well as practical phases of safety as applied to surface facilities; timbering and roof

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control; transportation, storage, and use of explosives; ventilation and mine gases; coal dust and rock dust; haulage; electricity; safeguarding equipment; fire prevention and control; and other miscellaneous items. The course includes lectures, class discussions, demonstrations, and visual aids, such as motion pictures, slides, and blackboard sketches.

The training program has been successful; and from March 1948, when the revised course was first offered, to December 31, 1956, 19,514 coal-mine supervisors and others aspiring to similar positions completed the training (see appendix H for 1956 training).

Electrical Safety Course

A course in electrical safety - Electrical Fundamentals and Principals for Coal-Mine Electricians and Supervisors - was prepared by personnel of the Division of Coal-Mine Inspection, and initial training in the industry was begun in 1954. To date, 147 coal-mine personnel, 9 State inspectors, and 15 Federal inspectors have completed the course.

The Holmes Safety Association

Coal-mine-inspection personnel take an active interest in the Holmes Safety Association, which has been sponsored by the Bureau of Mines since 1926. The association was organized as part of the Bureau's safety-education program to promote health and safety in the mineral industries through the cooperative efforts of management and labor and State and Federal agencies. Since 1954 the Bureau has intensified its efforts to expand the operations of the organization to mining areas in all parts of the United States, and its efforts are continuing to be successful. This stepped-up program is being conducted by specially trained personnel in the Division of Coal-Mine Inspection in the coal-mining areas. As a result of this drive, at the end of 1956, 304 chapters, 25 local councils, 2 State councils, and 1 national council were active in 12 States and Washington, D. C.

Experience has proved that injury rates are lower than average in mines that have membership in this association.

Investigation of Fatal Coal-Mine Accidents

The Bureau of Mines has investigated major mine disasters since its inception in 1910 as part of its accident-prevention program, and the conclusions drawn from these investigations have been used as bases for recommending measures to prevent recurrences. The Bureau also has investigated explosions and fires in which less than five or no lives were lost, but before 1950 it was not the general practice to investigate fatalities resulting from occurrences other than mine fires or explosions. The Bureau has long recognized the need for a comprehensive study of fatal accidents, but the task was too great for the limited personnel available. The reduced frequency of fatalities in coal mines and the increased inspection personnel provided for by the Congress in recent years permitted the achievement of this goal, and all fatal accidents have been investigated since February 10, 1950. A report of each investigation is prepared by the Federal inspector and is distributed to the instructors of the accident-prevention courses and the same agencies and persons who ordinarily would receive copies of the regular coal-mine-inspection reports. The report gives facts about the accident, the inspector's conclusions on the cause, and recommendations for preventing similar occurrences.

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Condensed reports on the investigations of coal-mine fatalities since 1950 have been published annually. It is particularly useful to officials of coal companies and mine workers' organizations in planning accident-prevention programs; to safety directors, inspectors, instructors, and supervisors who need such information to carry out their duties more effectively; and to mine workers who must know the causes of accidents to be better able to prevent injury to themselves and their fellow workmen. The ultimate objective is to provide information that will be helpful in preventing accidents.

The Bureau of Mines is the only agency that assembles, on a nationwide basis, detailed reports on the investigations of all fatalities in coal mines in the United States and Alaska.

Roof-Control Work

Accident statistics have indicated for years that falls of roof and coal cause more than half the fatalities in coal mines; this fact has challenged everyone interested in improving accident rates in the coal-mining industry. The Bureau of Mines has done considerable research on mine-roof control when funds were available, but to 1948 no person or agency had produced any new or improved means of satisfactorily solving the problems presented by this No. 1 killer in the coal mines. The Bureau realized that to reduce coal-mine injuries and deaths, it would be necessary to find better methods of roof control; and its efforts in that direction finally culminated in a new method of roof control known as roof bolting which was introduced into the coal-mining industry in 1948. The basic principle of this method is to prevent the initial sag in exposed roof strata by converting the strata into a rigid beam, with steel bolts set in holes drilled in the roof rock. The bolts must be installed as soon as the roof is exposed by the normal process of mining.

After experimenting to prove the practicability and safety of bolting under controlled conditions, the method was widely publicized in Bureau of Mines publications and trade journals. To satisfy the demand by mine operators for Bureau suggestions on roof-bolt installation and to assure a method that would not be condemned as a failure because of improper installations, the Bureau trained certain Federal coal-mine inspectors and engineers to qualify as expert consultants in roof bolting. These men are headquartered in coal-mining areas where their consulting services are needed, and the mine operators generally obtain their advice and recommendations before purchasing any bolts. Some States require mine operators to obtain a permit from the State inspection agency before roof bolting can be done. Such wise precautions have contributed much to the success of this new method of roof control.

Before roof bolting is adopted in any mine, the Bureau of Mines recommends controlled experiments - in conformance with procedures that have been worked out by the Bureau of Mines - to determine whether roof bolting is applicable. (Auxiliary conventional supports are used to control the roof during the initial experimentation.) After a safe, economical method of bolting is determined, no deviation from that method should be made without undergoing a new experimental period. If roof conditions change radically from those encountered during the initial experimental period, a new experimental period should be undergone.

Federal coal-mine inspectors observe roof-bolting procedures during regular inspections of coal mines and report deviations from established plans and other substandard practices of roof support.

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Roof bolts are used exclusively in a number of large mines, and about 35 percent of the 1956 bituminous-coal production was mined under bolted roof. Installations have not been made in enough mines to have a notable effect on the accident rates of the entire coal-mining industry. However, the increased use of roof bolts and the success attained at mines where they have been installed indicate what can be expected from more general use.

The introduction of roof bolting to the coal-mining industry marks another major contribution of the Bureau of Mines in its efforts to attain the primary objective of the Congress in establishing the Bureau in 1910 - to prevent accidents in the mineral industries.

Supplemental to these roof-control activities, a mining engineer thoroughly studied the possibility of using various protective coatings to prevent disintegration of roof rock and gave special attention to the health and fire hazards involved. From this study a set of safety standards on roof-coating operations was prepared for the use of Federal inspectors and the industry.

To reduce further the incidence of roof-fall accidents, the Bureau of Mines initiated a Coal-Mine Roof-Control Course in May 1951. It requires from 30 minutes to 1 hour of lecture and discussion and is presented to coal-mine officials and employees by Federal coal-mine inspectors, usually after he completes the inspection of a mine. The course is designed to impress mine personnel with the need for more adequate roof-control measures and to make everyone concerned more roof conscious; it was introduced into the industry in July 1951, and from that time to December 31, 1956, 469,568 mine personnel completed the training (see appendix H for 1956 training).

Systematic timbering, the use of roof bolts, and training miners to be alert constantly to roof conditions have been effective in reducing fatalities, but roof falls still cause over half of all coal-mine fatalities, most of which occur within 12 feet of the working faces where the stability of the newly exposed roof cannot be determined immediately. To provide a guard against these unforeseen dangers, efforts are being continued to interest manufacturers and users of mechanical mining equipment in developing canopies over the equipment to lessen the severity of roof falls in the immediate, unprotected face areas.

The search for more effective roof support is continuing; the major efforts of two Bureau engineers have been concentrated on the possibility of strengthening and consolidating roof strata by injecting chemical bonding material into the bedding planes of the strata. Equipment was developed and tests were conducted successfully in 3 commercial mines - 2 in the Pittsburgh and 1 in the Upper Freeport coal beds - to determine the permeability of the strata by injecting oil into the bedding planes. After completing these tests, samples of adhesive materials were obtained from various manufacturers, and laboratory tests were made to evaluate the cohesive, adhesive, and setting-time characteristics of the materials. Equipment was developed to pump the most promising resins into the roof to bond the strata.

Intensive surveys are being made of conventional timbering systems to achieve immediate improvement in roof control and compliance with approved methods and to establish suitable, minimum timbering standards where none have been adopted.

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Coal-Mine-Haulage Safety Course

In April 1951 a Coal-Mine-Haulage Safety Course was completed and introduced into the coal-mining industry. It consists of lectures and illustrations on haulage safety and is presented to mine personnel by the Federal coal-mine inspectors, usually after completing an inspection. From April 1, 1951, to December 31, 1956, 161,867 coal-mine-haulage employees, officials, safety committeemen, and others attended the course (see appendix H for 1956 training). Considering the comparatively few men employed in haulage operations at coal mines, the number of trainees is outstanding.

Injury and Employment Data

One of the special duties of inspectors and engineers of the Division of Coal-Mine Inspection is to enlist the cooperation of coal-mine operators in submitting injury and employment statistics to the Bureau of Mines in compliance with sec. 105 of the Federal Coal-Mine Safety Act. If an operator needs instruction on how to complete the proper forms, inspectors or engineers are prepared to give advice. Through this service, performed when the mine is being inspected, more and better reports have been submitted to the Bureau by the mine operators.

Ventilation Surveys

Certain mining engineers of the Division of Coal-Mine Inspection are assigned to coal-mine-ventilation studies, surveys, and research. Difficult ventilation problems are encountered from time to time on which mine operators request Bureau assistance. Many of the studies require pressure surveys and technical calculations that the regular coal-mine inspectors seldom are equipped to make (appendix D, table 2).

Explosive Surveys

Mining-explosives engineers of the division conduct special investigations on storage, transportation, and use of explosives and blasting devices. Generally, the studies have been requested by mine operators who are interested in improving the safety and economy of their operations.

The Bureau of Mines has advocated the exclusive use of permissible explosives or permissible blasting devices in coal mines for many years and has advised against the use of black blasting powder and dynamite, which have caused so many gas and dust explosions with heavy casualities. Mining-explosives engineers have done considerable educational work, demonstrating to mine operators by performance tests in the mines that permissible explosives are much safer than black blasting powder and just as economical. Through their efforts and those of the regular coal-mine inspectors, dangerous black blasting powder, has been disappearing rapidly from coal mines. The mandatory provisions of Title II ban the storage, use, and handling of black blasting powder in Title II mines; and the mining-explosives engineers have been of great assistance to coal-mine operators in making the required changeover to safer methods of breaking down the coal efficiently (appendix D, table 2).

Electrical Surveys

Mining-electrical engineers and electrical inspectors of the Division of Coal-Mine Inspection conduct special technical investigations of electrical facilities and installations in coal mines, generally at the request of mine operators (appendix D, table 2). These engineers also are assigned to cooperate with industry in

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conducting research on electrical apparatus, with a view toward designing safer equipment. The electrical inspectors advise and assist coal-mine inspectors in determining the status of permissible electrical face equipment, as required by sec. 209 (f)(1) of the Federal Coal-Mine Safety Act.

Research is being continued to develop improved equivalent protective devices to replace the frame-grounding conductors in trailing cables of mobile electrical equipment. The reduction of insulating materials in and the increased rigidity of trailing cables necessitated by incorporating an additional conductor have caused many trailing-cable failures - some with disastrous results. Manufacturers of such equipment are cooperating, and several devices have been certified by the Bureau as acceptable. Personnel of the Division of Coal-Mine Inspection is conducting field surveys to determine the effectiveness of the devices in actual service.

Dust Surveys

A course of instruction in the Determination and Control of Unhygienic Dusts was given January 21-31, 1946, by personnel of the Bureau's Branch of Health Research to certain employees of the Divisions of Safety and Coal-Mine Inspection. The objective was to provide each main field station with a man qualified to determine the concentration of airborne dusts in coal mines and to cooperate in such surveys with dust experts of the Division of Health.

The importance of dust control in coal mines is recognized by the mining industry, and the Bureau of Mines is continuing its research on airborne mine dusts to provide enough data to be used as a basis to determine concentrations of certain dusts that are considered harmful from a health standpoint and to determine the method and type of facilities best suited to control dusts.

In promoting roof bolting the Bureau has been aware of the health hazard introduced by drilling holes in silica-bearing strata. In keeping with Bureau policy to see that proper equipment is available to the industry, Bureau of Mines Schedule 25, Procedure for Testing Dust Collectors for Permissibility for Use in Connection With Rock Drilling in Coal Mines, was approved January 23, 1952 (amended July 23, 1952). Many dust collectors have met the requirements of Schedule 25 and have been approved and are available for use in coal mines.

To provide more efficient, economical means of preventing the propagation of dust explosions in bituminous-coal mines, an engineer of the Division of Coal-Mine Inspection has been assigned to determine through intensive research the possibilities of devising new and more practical, effective, and positive means of preventing the propagation of dust explosions underground, other than by the use of dry rock dust; to develop more economical and efficient means of applying rock dust on mine surfaces; and to find improved methods and equipment for sampling dust in a coal mine to determine promptly whether or not rock-dust applications are adequate. Beneficial results of the program will be made available to the coal-mining industry. Efforts to develop a substitute for rock dusting in coal mines - a method of spraying mine surfaces with a viscous material that will entrap mine dusts that contact it - has resulted in research by a manufacturer of such materials to develop a suitable product.

Research to Minimize Hydraulic-Fluid Fire Hazards

Late in 1955 a study was initiated to determine what test procedures the Bureau should follow to develop economical, nonflammable hydraulic fluids for use in mine equipment. A cooperative program with mine operators and manufacturers of mining

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equipment and hydraulic fluids and their components, participating toward this end, was effectuated, and prospects appear promising. The flammable fluids now used in hydraulic-controlled equipment in mines present serious hazards when fires occur in or near the equipment. Bursting hydraulic systems have caused many mine fires to spread out of control. An economical, efficient, nonflammable fluid would materially decrease these occurrences.

Fire-Resistant Trailing Cables

To combat recurring trailing-cable fires, an investigation is being made to determine the possibility of using fire-resistant materials as insulation to replace the flammable rubber compounds now used to cover cable conductors and the flammable materials used to insulate cable splices. One cable manufacturer has done considerable research and expects to have a cable ready for testing in the near future.

Safety Standards

Minimum standards for fire-fighting equipment have been approved by representatives of the mine workers and the mine operators and will be published in the Federal Register as an official interpretation of suitable fire-fighting equipment required by sec. 209(g)(1) of the Federal Coal-Mine Safety Act.

Approval of the proposed Tentative Safety Standards for Shaft-Sinking Operations has been delayed pending further discussion with representatives of the industry.

Study of Natural-Gas Restorage Areas in Coalfields

Because the restorage of natural gas (some at pressures above the initial rock pressures) in the exhausted sands under active coal-mining areas and the installation of high-pressure gas-transmission lines overlying active coal-mining areas present potential gas-explosion hazards in the adjacent coal-bearing strata, considerable work has been done to chart and correlate the gas-restorage fields and the gas-transmission lines with the active coal-mining areas. Division personnel and coal-mine operators have appeared at hearings before legislative committees to assist in formulating legislation to protect coal-mine workmen and mining properties.

Participation in Safety Organizations

Personnel of the Division of Coal-Mine Inspection serves as officers and committee members and participates in the various programs of the National Safety Council and its affiliated regional organizations and in the Mine Inspectors' Institute of America, the National Mine Rescue Association, the American Mining Congress, and other national, regional, and local safety organizations throughout the United States.

The chief of the division serves as secretary of the Coal Mining Section of the National Safety Council and is editor of the section's monthly newsletter.

Cooperation With Other Federal Agencies

Personnel of the Division of Coal-Mine Inspection has accepted special assignments from other Federal agencies to Colombia, Austria, Korea, Venezuela, Turkey, Germany, Burma, and India. Except for the assignment in Burma, all of these missions have been completed.

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Assignments of engineers and inspectors serve a twofold purpose: (1) The agency to which the Bureau expert is loaned receives the benefit of his wide experience in mining, and the expert in turn, adds to his fund of knowledge; and (2) the information obtained through this special work is made available to the mining industry if it is deemed in the public interest.

Personnel of the Division of Coal-Mine Inspection cooperates with the Wage and Hour and Public Contract Divisions, United States Department of Labor, in administering the Public Contracts section of the Walsh-Healy Act: The Bureau of Mines field office informs the regional office of the Wage and Hour and Public Contracts Divisions when hazards are found by Federal coal-mine inspectors at mines that are under contract to furnish coal to the Federal Government. The Labor Department requires the mine operator to eliminate the dangers or face cancellation of the contract.

Under order 1940, April 4, 1944, the Secretary of the Interior delegated to the Bureau of Mines the responsibility for all mine-safety inspections of mining operations on public domain, Indian lands, and other Government-lease mining operations. In addition to the usual inspection procedures the Bureau makes these investigations in conformance with the applicable parts of the regulations of the Federal Geological Survey, the Office of Indian Affairs, and the General Land Office; copies of the reports are sent to the Geological Survey.

Revision of State Coal-Mining Laws

Since 1947 the Division of Coal-Mine Inspection has helped to prepare proposed revisions of the coal-mining laws of 12 States.

The safety-regulations sections of the proposed revisions were designed along the lines of the Federal Mine Safety Codes, assuring more modern and standardized State coal-mining laws; they have been adopted, substantially as written, in Alabama, Colorado, Indiana, Maryland, Montana, Tennessee, and Wyoming. Proposed revisions of these laws for Arkansas, Illinois, Kentucky, Ohio, and Oklahoma were prepared, but they were either not enacted or not introduced in the legislature.

The Bureau of Mines will continue to furnish this service to any agencies directly concerned with improving State mining laws, such as labor organizations, coal operators' associations, and State officials.

This contribution toward the reduction of injuries in coal mines is another major and vitally important step by the Bureau to fulfill its obligations to the coal-mining industry.

First-Aid and Mine Rescue Training

Personnel of the division conducted first-aid and mine rescue training for coal-mine personnel in 1956; 9,892 persons completed the course in first aid, and 448 persons completed the mine rescue training (appendix H).

Miscellaneous Special Assignments

The miscellaneous special assignments completed during 1956 are listed in appendix I.

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ACHIEVEMENTS

This report covers the 4th full calendar year of coal-mine inspections under the Federal Coal-Mine Safety Act and the 15th full calendar year since Federal coal-mine inspections were begun. The effectiveness of the work by all concerned in fulfilling the principal purpose of Federal inspections - the reduction of accidents in coal mines - is revealed in part by comparing injury records for equal 10-year periods before and after 1941, when the law became effective. Injury figures for the calendar years 1952-56 also are given to start building up a new 10-year period.

For the 10 years before Federal inspection of coal mines, the fatality-frequency rate per million man-hours of exposure in the Pennsylvania anthracite mines was 1.61, and the nonfatal-frequency rate 105.94; and for the next 10 years, under Federal inspections, the fatality rate was 1.12 and the nonfatal rate 80.19. For the subsequent 5 years (1952-56) the fatality-frequency rate for anthracite mines was 1.13 and the nonfatal rate 66.07.

For the 10 years before Federal inspection of coal mines the fatality-frequency rate in bituminous-coal mines was 1.48 and the nonfatal frequency rate 65.81; and for the next 10 years, under Federal inspections, the fatality rate was 1.19 and the nonfatal rate 55.58. For the subsequent 5 years (1952-56) the fatality-frequency rate dropped to 0.96 and the nonfatal rate to 45.28. (See appendix J, table 1.)

The number of fatal and nonfatal injuries, by calendar years, that have occurred in the coal mines of the United States since 1932, is given in appendix J, table 2. Preliminary figures indicate that fatalities increased from 417 in 1955 to 444 in 1956, but that nonfatal injuries decreased from 19,570 to 19,115. The fatal-accident frequency rate increased from 1.04 in 1955 to 1.08 in 1956, but the nonfatal-accident frequency rate decreased from 48.82 in 1955 to 46.42 in 1956.

The number of major coal-mine disasters in the United States and the resulting fatalities are listed for each year since 1931 in appendix J, table 3. (A major disaster is any accident that causes the death of five or more persons.) Two major coal-mine disasters occurred between the date when the Federal Coal-Mine Safety Act became effective and December 31, 1956. The first, in 1953, caused the death of five men in an Iowa mine and was the result of a coal-dust explosion initiated by a blown-out charge of black blasting powder. A temporary restraining order, issued by a State court, had prohibited Federal inspectors from enforcing the ban on the use of black blasting powder as provided for in the Federal Coal-Mine Safety Act. The other (in November 1954) killed 16 men - 1 on the surface and 15 entombed underground - when a violent explosion followed by a roaring mine fire, necessitated sealing the mine-surface openings to smother the fire before recovery could proceed.

Appendix J, table 4 compares the underground-fatality frequency experience in Titles I and II mines from 1951 through 1956.

The favorable results attained during the past 15 years are not attributable to the efforts of any one group or agency, but it is well known in mining circles that Federal coal-mine-inspection activities have been and continue to be a potent influence in giving deserved attention to health and safety in coal mines. The Bureau has strived, with success, to have management and labor work hand-in-hand to settle health and safety problems. The cooperative efforts of management, labor, State inspection agencies, manufacturers of mining equipment, coal operators' associations, the Federal Bureau of Mines, and other agencies interested in mine safety have brought about the improvements in conditions and practices that have resulted in the continuing reduction in coal-mine injuries.

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NEED FOR LEGISLATIVE ACTION

Many hazards that could lead to disasters are being eliminated in the mines that are within the scope of the mandatory provisions of the Federal Coal-Mine Safety Act, but much more could be accomplished if the enforcement powers of the Federal inspectors were expanded to cover most of the smaller mines (those employing less than 15 men underground), which, as a group, are poorly regulated. This is borne out by the fact that the underground-fatality frequency rate for mines employing less than 15 men underground (Title I mines) was 2.84 in 1956, compared with 1.18 for mines employing 15 or more men underground (Title II mines). The data are given in appendix J, table 4.

PUBLICATIONS

Personnel of the division prepared or collaborated on the following 1956 publications of the Bureau of Mines:

Publication	Title	Authors
HSS-444.	Fatalities at Pennsylvania Anthracite Mines, 1955.	Joseph V. Mather
HSS-445.	Falls of Roof,-The No. 1 Killer at Bituminous-Coal Mines, 1955.	E. R. Maize and J. J. Wallace
I. C.-7734.	Administration of the Federal Coal-Mine Safety Act, Calendar Year 1954.	James Westfield, H. F. Weaver, and C. M. Keenan
I. C.-7749.	Safety Aspects of Controls and Operations of Belt Conveyors in Coal Mines.	C. L. Brown
I. C.-7765.	Administration of the Federal Coal-Mine Safety Act, Calendar Year 1955.	James Westfield, H. F. Weaver, and C. M. Keenan
R. I.-5198.	Fire and Explosion Hazards in Thermal Coal-Drying Plants.	H. R. Brown, C. J. Dalzell, I. Hartmann, G. J. R. Toothman, and C. H. Schwartz
R. I.-5288.	Methane Buildup During Cutting and Continuous Mining Operations.	R. W. Stahl and C. H. Dodge

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APPENDIX A

TABLE 1. - Personnel of the Division of Coal-Mine Inspection as of Dec. 31, 1956, and coal area covered by each field office

Health and Safety District A

Edward H. McCleary, District Supervisor
Wilkes-Barre, Pa.

Coal area covered - Pennsylvania anthracite region

Nicholas M. Benson	Coal-mine inspector	Wilkes-Barre, Pa.
Robert W. Brown	do.	Do.
Lee B. Carson	do.	Do.
George W. Culverhouse	do.	Do.
Gerald W. Fortney	do.	Do.
David M. Hart	do.	Do.
Charles E. Jones	do.	Do.
James R. Laird	do.	Do.
Harvey P. Landis	do.	Do.
Joseph R. Lindsey	do.	Do.
Joseph V. Mather	Mining engineer (explosives)	Do.
James A. Moore	Coal-mine inspector	Do.
Frank A. Retsel	do.	Do.
Clair S. Sigworth	do.	Do.
Arthur A. Sinicrope	do.	Do.
Joseph E. Stanton	do.	Do.
William T. Torrance	do.	Do.
Pauline Bankovich	Clerk	Do.
Ruth A. Ginley	do.	Do.
Martha A. Karweta	do.	Do.
Lillian T. Levandoski	do.	Do.
Bridget H. Lipp	do.	Do.
Betty Schappert	do.	Do.
Josephine M. Serino	do.	Do.
Madeline L. Wilson	do.	Do.
Gerald W. Croyle	Coal-mine inspector	Schuylkill Haven, Pa.
Theodore F. Deak	do.	Do.
John A. Fulmer	do.	Do.
Harry A. Schrecengost	do.	Do.
Roy E. Seiger	do.	Do.
Robert C. Todd	do.	Do.
Harrison F. Wilson	do.	Do.
Sylvia M. Crossley	Clerk	Do.

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Health and Safety District B

W. Dan Walker, Jr., District Supervisor
Pittsburgh, Pa.

Alexander E. Morrow, Assistant to District Supervisor

Coal area covered - Pittsburgh Office (Allegheny, Armstrong, Beaver, Butler, Clarion, Fayette, Greene, Lawrence, Mercer, Venango, Washington, and Westmoreland Counties)

F. Delbert Baker	Coal-mine inspector	Pittsburgh, Pa.
James A. Bennett	do.	Do.
Clyde L. Brown	Mining engineer (electrical)	Do.
Wymar G. Cooper	Coal-mine inspector (RC)1/	Do.
Robert T. Davis	Coal-mine inspector	Do.
Junior H. Dumire	do.	Do.
John W. Holcomb	do.	Do.
Ralph I. Krek	Coal-mine electrical inspector	Do.
Earl R. Maize	Mining methods research engineer	Do.
Samuel P. Polack	Health and safety engineer	Do.
Milton J. Satterfield	Coal-mine inspector	Do.
R. Ward Stahl	Health and safety engineer	Do.
Glenn J. R. Toothman	do.	Do.
Everett Turner	Coal-mine inspector	Do.
Joseph B. Yanity	do.	Do.
David T. Parry	Coal-mine inspector	Butler, Pa.
Edward C. Dydo	do.	Greensburg, Pa.
Stacy L. Stiles	do.	Do.
John Risko	do.	Grove City, Pa.
Albert C. Husted	do.	Kittanning, Pa.
Lawrence S. Johnston	do.	Do.
Arthur C. Jones	do.	Uniontown, Pa.
Griffin L. Lynch	do.	Do.
William L. Lyons	do.	Do.
Frank Heffers	do.	Washington, Pa.
Robert J. Kirk	do.	Do.
Gordon W. Chastain	do.	Waynesburg, Pa.
Michael A. Yuhase	do.	Do.
Frances A. Begg	Clerk	Pittsburgh, Pa.
Angelina B. Carr	do.	Do.
Rosella E. Everett	do.	Do.
Wirginia I. Graham	do.	Do.
Agnes M. Hadfield	do.	Do.
Martha E. Hanulik	do.	Do.
Hilda K. Krumm	do.	Do.
Margaret Lang	do.	Do.
Rose Silver	do.	Do.

1/ RC - Roof Control

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C. J. Dalzell, Subdistrict Supervisor
Johnstown, Pa.

Coal area covered - Pennsylvania (Bedford, Blair, Cambria, Clearfield, Centre, Clinton, Elk, Huntington, Indiana, Jefferson, Lycoming, Somerset, and Tioga Counties).

Stephen A. Andrejko, Jr.	Coal-mine inspector	Johnstown, Pa.
Wilburn C. Cagley	do.	Do.
W. M. Demkowicz	do.	Do.
William R. Devett	Coal-mine electrical inspector	Do.
Frank A. Koza	Coal-mine inspector	Do.
S. A. Magistrella	do.	Do.
Deward W. Moore	do.	Do.
Garrett M. Mortensen	do.	Do.
Victor D. Null	do.	Do.
Gomer Reese, Jr.	do.	Do.
Don W. Snow	do.	Do.
De Jack Vittitow	Health and safety engineer (RC)	Do.
John A. Noon	Coal-mine inspector	Barnesboro, Pa.
Omar Elkins	do.	Berlin, Pa.
Norman Rumburg	do.	Cherry Tree, Pa.
Patrick J. Beatty	do.	Clearfield, Pa.
Richard H. Reid	do.	Do.
T. J. McDonald	do.	Ebensburg, Pa.
Walter D. Brown	do.	Indiana, Pa.
W. O. Montgomery	do.	Do.
Charles H. Gaskill	do.	Punxsutawney, Pa.
Harry L. Scott	do.	Do.
Lucille L. Foltz	Clerk	Johnstown, Pa.
Madeline M. Gelet	do.	Do.
Catherine A. Naylor	do.	Do.
Ethel P. Romeo	do.	Do.
Joan M. Rudolph	do.	Do.
Mary Louise Smutko	do.	Do.
Vera May Trabold	do.	Do.

T. C. Higgins, Subdistrict Supervisor
St. Clairsville, Ohio

Coal area covered - Ohio and West Virginia (Brooks, Hancock, Marshall, and Ohio Counties).

Richard E. Barr	Coal-mine inspector	St. Clairsville, Ohio.
John Barry	do.	Do.
William J. Buswink	do.	Do.
John T. Callahan	do.	Do.
John S. Eakins	do.	Do.
Fred R. Hilderbrand	Coal-mine electrical inspector	Do.
Richard Lloyd	Health and safety engineer (RC)	Do.
Edward J. Marron	Coal-mine inspector	Do.
William J. Symons	do.	Do.
John W. Zavora	do.	Do.
Frank E. Hughes	do.	Athens, Ohio.
Joseph C. Reardon	do.	Cambridge, Ohio.
Elsa M. Cara	Clerk	St. Clairsville, Ohio
Mary E. Duffy	do.	Do.
Anna M. Moskus	do.	Do.
B. S. Phillips	do.	Do.

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Health and Safety District C

William R. Park, District Supervisor
Mount Hope, W. Va.

Coal area covered - Mount Hope office (south of Jackson, Roane, Braxton, Webster, and Randolph Counties).

Thomas Allamon	Coal-mine inspector	Mount Hope, W. Va.
D. W. Barger	do.	Do.
Vernon H. Bowling	do.	Do.
Alpha B. Cavendish	do.	Do.
Robert M. Cain	do.	Do.
Arthur Charlesworth	do.	Do.
William M. Cordray	Health and safety engineer (RC)	Do.
Joseph S. Ferraro	Coal-mine inspector	Do.
Lloyd G. Fitzgerald	Mining engineer (explosives)	Do.
Anthony J. Fumich	Health and safety engineer (RC)	Do.
Frank J. Furin	Coal-mine inspector	Do.
F. J. Gallagher	Mining engineer (electrical)	Do.
Denver S. Griffith	Coal-mine inspector	Do.
James F. Haley	do.	Do.
Harold M. Hock	do.	Do.
Carl A. Kansala	do.	Do.
Fred E. Kemrite	do.	Do.
Luther A. Lewallen	do.	Do.
John Matsko	do.	Do.
James D. Micheal	do.	Do.
W. B. Michael	Coal-mine electrical inspector	Do.
Anthony Puskas	Coal-mine inspector	Do.
W. E. Stinnette	do.	Do.
Frank J. Stortz	do.	Do.
P. C. Van Natter	do.	Do.
Paul Wills	do.	Do.
Paul T. Akers	do.	Logan W. Va.
James G. Bosley	do.	Do.
Robert Calvert	do.	Do.
William T. Cummings	do.	Do.
Thomas W. Gay	do.	Do.
John C. Muir	do.	Do.
Lex Trunko	do.	Do.
James T. Whalen	do.	Do.
David L. Brown, Jr.	do.	Montgomery, W. Va.
Raymond C. DeWeese	do.	Do.
James A. Merrick	do.	Do.
Arthur L. Ulshafer	do.	Pineville, W. Va.
Michael J. Hovanec	do.	Princeton, W. Va.
Edward M. Lewis	Health and safety engineer (RC)	Do.
Denis C. McGinity	Coal-mine inspector	Do.
Elwood Menta	do.	Do.
William T. Trinkley	do.	Do.
Ward R. Vickers	do.	Do.
John Zeleskey	do.	Do.
F. H. Henderson	do.	Summersville, W. Va.
Leo M. Morelli	do.	Do.
George Noe	do.	Welch, W. Va.

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Helen E. Adams	Clerk	Mount Hope, W. Va.
Doris J. Bailey	do.	Do.
Gladys C. Davis	do.	Do.
Frances Dixon	do.	Do.
Louise V. Marchio	do.	Do.
Margaret L. McCool	do.	Do.
Norma J. McGraw	do.	Do.
Pasquale Pino	Custodial	Do.
Wanda June Pino	Clerk	Do.
Helen V. Pomykata	do.	Do.
Vivian J. Thomas	do.	Do.
Maybelle C. Weaver	do.	Do.
Emma Jane White	do.	Do.

J. S. Malesky, Subdistrict Supervisor
Barbourville, Ky.

Coal area covered - Kentucky east of Frankfort and west of and including Elliott, Morgan, Mahoffin, and Knott Counties and parts of Letcher and Harlan Counties west of Whitesburg and south of Harlan, respectively

William E. Duke	Coal-mine electrical inspector	Barbourville, Ky.
Jay D. Farris	Coal-mine inspector	Do.
Morris J. Hughes	do.	Do.
Clarence E. Hyde	do.	Do.
Ralph B. Jones	Health and safety engineer (RC)	Do.
Hobart B. Lynch	Coal-mine inspector	Do.
T. R. Mark	Coal-mine inspector	Do.
Clay Pate	do.	Do.
Thomas A. Redin	do.	Do.
Henry E. Basinger	do.	Harlan, Ky.
Dennie R. Hager	do.	Do.
Nestor L. Adams	do.	Hazard, Ky.
Noah B. Close	do.	Do.
Chester A. Latham	do.	Do.
Raymond Linville	do.	Do.
George W. Luke	do.	Do.
Wilma E. Allen	Clerk	Barbourville, Ky.
Alta Faye Bonza	do.	Do.
Carla S. Combs	do.	Do.
Janie T. Hammons	do.	Do.
Jewell M. Jones	do.	Do.
Wilma L. Wilson	do.	Do.

John J. Dougherty, Subdistrict Supervisor
Morgantown, W. Va.

Coal area covered - Maryland and West Virginia (north of Mason, Kanawha, Clay, Nicholas, and Pocahontas Counties and south of Marshall County)

William D. Baldwin	Coal-mine inspector	Morgantown, W. Va.
Jay C. Davis	do.	Do.
William C. Eiduke	do.	Do.
Roy C. Estep	do.	Do.
John C. Hartley	Health and safety engineer (RC)	Do.
Harry Jones	Coal-mine inspector	Do.
Charles D. McMaster	Coal-mine electrical inspector	Do.

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Louis E. O'Connor	Coal-mine inspector	Morgantown, W. Va.
Joseph F. Orlando	do.	Do.
R. T. Reay	do.	Do.
George M. Reid	do.	Do.
Matthew I. Duncan	do.	Buchannon, W. Va.
William R. Melville	do.	Clarksburg, W. Va.
Joseph Marshalek	do.	Elkins, W. Va.
Joseph J. Dobis	do.	Fairmont, W. Va.
John E. Jones	do.	Do.
Thomas J. Ward	do.	Frostburg, Md.
Paul M. Shay	do.	Grafton, W. Va.
Warden L. Evans	do.	Kingwood, W. Va.
Eileen M. Bryant	Clerk	Morgantown, W. Va.
Pauline B. Buretz	do.	Do.
Pauline W. Dusch	do.	Do.
Mary K. Elsey	do.	Do.
Teresa M. Jones	do.	Do.

James L. Gilley, Subdistrict Supervisor
Norton, Va.

Coal area covered - Virginia and those parts of eastern Kentucky east of Elliott, Morgan, Magoffin, and Knott Counties and parts of Letcher and Harlan Counties east of Whitesburg and north of Harlan, respectively

Leslie E. Allen	Coal-mine inspector	Norton, Va.
George M. Betchey	do.	Do.
Houston C. Brumbaugh	do.	Do.
Patrick J. Buchanan	do.	Do.
Charles C. Cavendish	do.	Do.
John H. Clawson	do.	Do.
George W. Colbert	do.	Do.
Francis A. Cress	do.	Do.
John G. Emershaw	do.	Do.
Frank L. Gaddy	Health and safety engineer (RC)	Do.
George L. Mears	Coal-mine inspector	Do.
George W. Parry	Health and safety engineer	Do.
Charles A. Smith	Coal-mine inspector	Do.
Peter F. Stevenson	Coal-mine inspector (RC)	Do.
William R. Stewart	Coal-mine inspector	Do.
Carl E. Stinnette	Coal-mine electrical inspector	Do.
John F. Wilson	Coal-mine inspector	Do.
Robert L. Cochran	do.	Do.
C. Leslie Bailey	do.	Grundy, Va.
John J. Pendergast, Jr.	do.	Do.
Harold R. Baker	do.	Pikeville, Ky.
William R. Burgess	do.	Do.
Clyde W. Casey	do.	Do.
Oscar W. Harris	do.	Do.
Calvin F. Watson	do.	Do.
Walter M. Allen	do.	Richlands, Va.
Charles B. Aspinwall	do.	Do.
James W. Cromwell	do.	Do.
Harold H. Wiley	do.	Do.
Fannie Bevins	Clerk	Norton, Va.
Gladys J. Ball	do.	Do.

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Lundia C. Clark	Clerk	Norton, Va.
Joan Green	do.	Do.
Billy W. Greene	Custodial service	Do.
Phyllis P. Hatcher	Clerk	Do.
Irene Moore	do.	Do.
Guyanne D. Parker	do.	Do.
Pat Bevins Robinson	do.	Do.
Martha C. Smith	do.	Do.

Health and Safety District D

Milton C. McCall, District Supervisor
Birmingham, Ala.

Coal area covered - Birmingham Office - Alabama, Georgia, and North Carolina

William Arthur	Coal-mine inspector	Birmingham, Ala.
Donald Bowker	do.	Do.
Thomas F. Curry	do.	Do.
Arthur Guthrie	do.	Do.
Carl F. Kahre	do.	Do.
Wilbur G. McCrary	do.	Do.
Henning Marstrander	do.	Do.
Haskel Melhorn	do.	Do.
Joe A. Rejonis	do.	Do.
Harry C. Young	Coal-mine inspector (RC)	Do.
Anna M. McFarland	Clerk	Do.
Jeannette S. Pike	do.	Do.
Catherine W. Ray	do.	Do.
Willette B. Tennent	do.	Do.

Eric H. Brown, Subdistrict Supervisor
Jellico, Tenn.

Coal area covered - Tennessee

Stephen J. Bukovitz	Coal-mine inspector	Jellico, Tenn.
Charles E. Estep	Coal-mine electrical inspector	Do.
Fornie A. Jordan	Coal-mine inspector	Do.
Joseph Neal	do.	Do.
Wilbur E. Stiles	do.	Do.
Fred W. Stout	Health and safety engineer	Do.
Dee Zimmermann	Coal-mine inspector	Do.
Herbert D. Couk	do.	Crossville, Tenn.
Jack Reese	do.	Do.
Ira Amburgey	do.	Jasper, Tenn.
Brooks Blackwood	do.	Do.
John D. Martin	do.	Do.
Lucille Light	Clerk	Jellico, Tenn.
Lois G. Trammel	do.	Do.
Nona S. Vermillion	do.	Do.
Gladys M. Warming	do.	Do.

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Health and Safety District E

Eugene E. Quenon, District Supervisor
Vincennes, Ind.

Coal area covered - Illinois, Iowa, Indiana, Kentucky (west of Frankfort) and Missouri

Sanford J. Douglas	Coal-mine electrical inspector	Vincennes, Ind.
Clement M. Dovidas	Coal-mine inspector	Do.
Newton M. Henson	do.	Do.
Leon W. Kelly	Coal-mine inspector (RC)	Do.
James A. O'Connor	Health and safety engineer	Do.
James A. McCune	Coal-mine inspector	Do.
James P. Sheridan	do.	Do.
Francis J. Smith	do.	Do.
Richard W. Whittaker	Health and safety engineer	Do.
Alvin T. Scully	Coal-mine inspector	Belleville, Ill.
Loren A. Belt	do.	Benton, Ill.
Ben J. Dona	do.	Do.
M. R. Messersmith	do.	Do.
Harry N. Smith	do.	Do.
Coy L. South	do.	Do.
Joseph R. Summary	do.	Do.
Brank Beck	do.	Madisonville, Ky.
Clifton Dupree	do.	Do.
Walter W. Kessler	do.	Staunton, Ill.
George W. Hammons	do.	Do.
Frank Perz	do.	Terre Haute, Ind.
Irene W. Adams	Clerk	Vincennes, Ind.
Clara M. Dreiman	do.	Do.
Anna C. Kaiser	do.	Do.
Lucile H. Martin	do.	Do.
Mary E. Meyer	do.	Do.
Leonard W. Pieper	do.	Do.
Cecelia C. Speth	do.	Do.
Georgia L. Van Lieu	do.	Do.

Health and Safety District G

George M. Kintz, District Supervisor
Dallas, Tex.

Robert D. Bradford, Subdistrict Supervisor
McAlester, Okla.

Coal area covered - Oklahoma, Arkansas, Kansas, and Texas

W. Marion Baker	Coal-mine electrical inspector	McAlester, Okla.
Michael Deak, Jr.	Coal-mine inspector	Do.
Mignonette Grantham	Clerk	Do.
Mary Romano	do.	Do.

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Health and Safety District H

J. Howard Bird, District Supervisor
Denver, Colo.

Coal area covered - Colorado, Montana, New Mexico (Colfax and Rio Arriba Counties), North Dakota, South Dakota, and Wyoming (Carbon, Converse, Campbell, Johnson, and Sheridan Counties)

J. J. Bastalich, Jr.	Coal-mine inspector	Denver, Colo.
A. Z. Dimitroff	Mining engineer (electrical)	Do.
Joseph Freeman	Coal-mine inspector	Do.
George B. Fritts	do.	Do.
A. C. Moschetti	do.	Do.
D. R. Ratkovich	do.	Do.
I. J. Ratliff	do.	Do.
E. L. Christensen	do.	Billings, Mont.
Andrew Hamilton	do.	Do.
William Roberts	do.	Grand Junction, Colo.
Carl T. Hallett	do.	Trinidad, Colo.
Marie Chambers	Clerk	Denver, Colo.
Emmylu Collins	do.	Do.
Ruth Garstka	do.	Do.
Dorothy Kennedy	do.	Do.
Kathryn R. Urban	do.	Do.

Raymond L. Ellis, Subdistrict Supervisor
Anchorage, Alaska

Coal area covered - Territory of Alaska

Mary T. Edgar	Clerk	Anchorage, Alaska.

Robert D. Reeder, Subdistrict Supervisor
Salt Lake City, Utah

Coal area covered - Idaho, Utah, and Wyoming (all counties not covered by Denver Office)

E. B. Confer	Health and safety engineer	Salt Lake City, Utah.
Andrew J. Kopp	Coal-mine inspector	Do.
L. D. Knill	Health and safety engineer	Do.
Thomas O'Neal	Coal-mine inspector	Do.
Thomas T. Reay	do.	Price, Utah
Ione Ayre	Clerk	Salt Lake City, Utah.
A. D. Speakman	do.	Do.

L. H. McGuire, Subdistrict Supervisor
Seattle, Wash.

Coal area covered - Washington and Oregon

E. J. Grillos	Health and safety engineer	Seattle, Wash.

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WASHINGTON OFFICE STAFF

BUREAU OF MINES

Marling J. Ankeny, Director

James Westfield, Assistant Director - Health and Safety

DIVISION OF COAL-MINE INSPECTION

H. F. Weaver, Chief

Malcolm L. Davis	Safety representative.
Raymon K. Franklin	Technical assistant.
Charles M. Keenan	Do.
George M. Smith	Safety representative.
Dorothy M. Alden	Clerk.
Rose Merriam Bell	Do.
Margaret A. Bobby	Do.
Martha E. Patton	Do.
Perna A. Zott	Do.

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TABLE 2. - Distribution of coal-mine inspectors and electrical inspectors, Dec. 31, 1956

Field office	Coal-mine inspectors						Coal-mine electrical inspectors		
	GS-9	GS-11	GS-12	GS-13	GS-14	Total	GS-9	GS-11	Total
Wilkes-Barre, Pa.	0	12	11	0	1	24	0	0	0
Pittsburgh, Pa.	0	14	8	0	1	23	0	1	1
Johnstown, Pa.	0	14	6	1	0	21	0	1	1
St. Clairsville, Ohio .	0	8	2	1	0	11	0	1	1
Mount Hope, W. Va.	4	26	12	0	1	43	0	1	1
Morgantown, W. Va.	0	9	8	1	0	18	0	1	1
Norton, Va.	0	20	6	1	0	27	0	1	1
Barbourville, Ky.	1	11	2	1	0	15	0	1	1
Birmingham, Ala.	0	7	3	0	1	11	0	0	0
Jellico, Tenn.	0	7	3	1	0	11	0	1	1
Vincennes, Ind.	0	10	8	0	1	19	0	1	1
McAlester, Okla.	0	1	0	1	0	2	0	1	1
Denver, Colo.	0	6	4	0	1	11	0	0	0
Salt Lake City, Utah ..	0	1	2	1	0	4	0	0	0
Phoenix, Ariz.	0	0	0	0	0	0	0	0	0
Seattle, Wash.	0	0	0	0	0	0	0	0	0
Anchorage, Alaska	0	0	1	0	0	1	0	0	0
General	0	0	0	5	0	5	0	0	0
Total	5	146	76	13	6	1/246	0	10	10

1/ Includes:
6 district supervisors (excluding districts F and G);
9 subdistrict supervisors (excluding Seattle, Phoenix, San Francisco, and Albany, N. Y.);
2 safety representatives (liaison officers, Washington, D. C.);
2 technical assistants (Washington, D. C.);
1 mines safety representative (Holmes Safety Association).

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TABLE 3. - Distribution of engineers, Dec. 31, 1956

Field office	GS-9	GS-11	GS-12	GS-13	GS-14	GS-15	Total
Wilkes-Barre, Pa.	0	0	1	0	0	0	1
Pittsburgh, Pa.	0	1	1/3	3	0	0	7
Johnstown, Pa.	0	0	1	0	0	0	1
St. Clairsville, Ohio	0	1	0	0	0	0	1
Mount Hope, W. Va.	0	2	3	0	0	0	5
Morgantown, W. Va.	0	0	1	0	0	0	1
Norton, Va.	0	1	1	0	0	0	2
Barbourville, Ky.	0	1	0	0	0	0	1
Birmingham, Ala.	0	0	0	0	0	0	0
Jellico, Tenn.	0	0	1	0	0	0	1
Vincennes, Ind.	0	0	1	1	0	0	2
McAlester, Okla.	0	0	0	0	0	0	0
Denver, Colo.	0	0	1	0	0	0	1
Salt Lake City, Utah	0	0	2	0	0	0	2
Phoenix, Ariz.	0	0	0	0	0	0	0
Seattle, Wash.	0	1	0	0	0	0	1
Anchorage, Alaska	0	0	0	0	0	0	0
General	0	0	0	3	2	1	6
Total	0	7	15	7	2	1	32

1/ 1 engineer on temporary foreign assignment.

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APPENDIX B

TABLE 1. - Details of inspection data, Title II mines, 1956

State	Title II mine inspections	Joint State-Federal inspections 1/	Violations sec. 209 observed	Mines at which form B notices were issued	Notices issued			Orders issued			Mines at which orders were issued		Mines free of violations of Title II	Title II mines inspected
					Form B (original)	Form C Violations abated	Form C Time extended	Form A, sec. 203(a)	Form D, sec. 203(c)	Form B-1 sec. 203(d)	Form A	Form D		
Alabama	61	0	67	4	7	7	0	1	0	0	1	0	10	29
Alaska	5	5	3	1	2	2	0	0	0	0	0	0	2	3
Arizona	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arkansas	13	0	36	3	7	7	1	2	0	0	1	0	1	5
California	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Colorado	52	0	116	15	46	51	12	0	0	1	0	0	6	22
Georgia	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Idaho	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Illinois	127	0	283	6	11	14	0	2	0	2	2	0	20	44
Indiana	35	0	118	5	17	30	3	2	0	0	1	0	6	10
Iowa	7	0	0	0	0	0	0	0	0	0	0	0	3	3
Kansas	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kentucky	751	0	1,916	127	469	449	22	8	24	2	7	10	54	313
Maryland	14	0	18	2	3	3	0	0	0	0	0	0	3	5
Michigan	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Missouri	16	0	5	1	1	0	2	1	0	0	1	0	8	8
Montana	4	0	0	0	0	0	0	1	0	0	1	0	3	3
New Mexico	5	0	5	0	0	0	0	0	0	0	0	0	1	2
North Carolina	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North Dakota	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ohio	119	0	232	8	22	22	15	0	0	1	0	0	4	43
Oklahoma	13	13	22	2	3	3	0	1	0	0	1	0	2	5
Oregon	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pennsylvania (anthracite)	248	0	250	29	63	63	96	13	0	0	10	0	70	90
Pennsylvania (bituminous)	527	0	1,406	48	84	86	22	0	0	2	0	0	43	214
South Dakota	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tennessee	109	0	206	13	27	27	2	4	0	0	2	0	13	43
Texas	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Utah	47	0	89	3	3	5	0	3	0	0	3	0	0	16
Virginia	309	0	824	68	162	189	12	5	11	0	3	5	18	122
Washington	14	13	1	1	1	1	0	0	0	0	0	0	3	7
West Virginia	1,159	0	3,846	176	461	456	83	6	12	1	3	4	58	518
Wyoming	13	12	26	0	0	0	0	0	0	0	0	0	3	6
Total	3,648	43	9,469	512	1,389	1,415	270	49	47	2/9	36	19	331	1,511

1/ Included in Title II mine inspections.
2/ 1 order annulled by Director following appeal from operator.

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TABLE 2. - Withdrawal orders issued under sec. 203(a) for imminent danger, by States, July 16, 1952 - Dec. 31, 1956

Conditions constituting imminent dangers	Alaska	Alabama	Arkansas	Colorado	Illinois	Indiana	Kansas	Kentucky	Montana	Missouri	Ohio	Oklahoma	Pennsylvania (anthracite)	Pennsylvania (bituminous)	Tennessee	Utah	Virginia	Washington	West Virginia	Total
Man-trip:																				
Dangerous roof	1	-	-	-	3	-	-	3	-	-	-	-	-	2	5	-	14	-	14	43
Poor track and equipment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
Poor track and dangerous roof	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
Man hoist:																				
Worn rope	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Shaft partition and cages deteriorated	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
Mine fire:																				
Active fire adjacent to producing area	1	-	-	-	1	1	-	2	-	-	-	-	5	2	-	4	-	-	4	20
Electric-arc hazards, accumulated coal and coal dust	-	-	1	-	2	-	-	8	-	-	-	-	-	-	-	-	2	-	2	15
Poor electrical installations	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	5	-	5	12
Loose coal, inadequate ventilation, open oil containers	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	1	-	-	3
Black powder, no rock dust, no fire-fighting equipment	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
No fire-fighting equipment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	2	3
Fire at blowing fan on surface	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1
Loose coal and coal dust, inadequate rock dust, blasting off solid with fuse	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1
Explosion:																				
Excessive methane liberations	-	-	-	1	-	1	-	-	-	-	-	-	1	-	-	2	-	-	-	5
Methane and dust accumulations	-	-	-	-	4	1	-	-	-	-	-	1	-	-	-	-	-	-	1	7
Methane accumulations	-	-	-	-	1	2	1	1	-	-	1	-	22	1	-	-	-	-	1	30
Leak in surface gasoline line	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
Inadequate rock dusting	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	5	6
Coal-dust accumulations, no rock dust, poor ventilation	-	-	2	1	7	-	-	1	-	-	-	1	-	-	1	-	5	-	16	34
Active mine fire	-	-	-	-	3	1	-	1	-	-	-	1	1	-	-	2	-	-	-	9
Black powder, inadequate rock dusting	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Explosion disrupted ventilation	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	3
Coal-dust stemming, no tests for gas, doors open	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	2
Excessive methane in air currents	-	-	3	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	4
Approaching gas-filled sealed areas	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
Inadequate ventilation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	2
Coal-dust accumulations, electric-arc hazards	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2
Inundation:																				
Working under body of water	-	-	1	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	3
Advancing toward abandoned workings	-	-	-	-	-	-	-	1	-	-	-	-	1	-	1	-	3	-	-	6
Inflow of oxygen-deficient air and/or carbon monoxide	-	-	-	-	1	-	-	-	-	-	-	-	2	-	-	-	1	-	-	4
Impounded water	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	2
Inflow of surface wash	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1
Total	2	1	7	3	25	7	2	22	2	1	1	5	33	9	10	8	33	1	55	227

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TABLE 3. - Withdrawal orders issued under sec. 203(c) for failure to abate violations of sec. 209, by States, July 16, 1952 - Dec. 31, 1956

Sections violated	Alabama	Arkansas	Colorado	Illinois	Indiana	Iowa	Kentucky	Missouri	Ohio	Pennsylvania (anthracite)	Pennsylvania (bituminous)	Tennessee	Utah	Virginia	West Virginia	Total
209(c)	-	-	-	-	-	-	8	-	-	-	2	-	-	1	9	20
209(d) (1) ...	3	1	-	1	-	-	27	1	1	5	7	3	-	9	9	67
209(d) (2) ...	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
209(d) (6) ...	-	-	-	3	-	-	1	-	-	-	1	-	-	-	3	8
209(d) (7) ...	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	2
209(d) (8) ...	-	-	-	-	-	-	18	-	1	-	1	-	-	1	-	21
209(d) (9) ...	-	-	-	1	1	-	2	-	-	-	-	-	-	-	2	6
209(e) (1) ...	-	-	-	2	-	-	20	-	-	-	9	2	-	12	13	58
209(e) (3) ...	-	-	-	1	1	4	23	-	1	-	3	2	-	8	8	51
209(e) (4) ...	-	-	-	-	-	-	6	-	-	-	2	1	-	-	2	11
209(e) (5) ...	-	-	1	-	1	-	21	-	-	-	12	4	-	15	9	63
209(f) (1) ...	-	-	-	-	-	-	1	-	-	-	3	-	-	-	2	6
209(g) (1) ...	-	-	-	1	-	-	6	-	-	-	2	-	-	2	7	18
209(g) (5) ...	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
209(h) (2) ...	-	-	-	-	-	-	-	-	-	1	-	-	1	1	2	5
209(h) (4) ...	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1
209(h) (5) ...	-	-	-	2	-	2	--	-	-	-	-	-	-	-	-	4
Total	3	1	1	12	3	6	133	1	3	7	42	12	1	52	66	343

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APPENDIX C

Appeals to Director on which hearings were necessary under sec. 206(c) and appeals to Federal Coal Mine Safety Board of Review under sec. 207, July 16, 1952 - Dec. 31, 1956

Mine and company	Reason for appeal	Disposition[1] Director	Board
	Sec. 203(d) orders		
Maxton Slope, Morrisdale Mining Co., Hawk Run, Pa.	Gassy classification		Appeal denied 10/18/52.
Glenmar No. 1, Moshannon-Smithing Coal Co., Beccaria, Pa.	do.	Appeal denied 12/31/52.	Appeal denied 2/24/53.
Ponfeigh Pine Hill, Pine Hill Smokeless Coal Co., Garrett, Pa.	do.	Order annulled 3/2/53; field investigation 12/8/52.	
Seaboard No. 1, Rebecca Coal Co., Richlands, Va.	do.	Appeal denied 6/16/53.	Appealed 7/8/53; order annulled 12/3/53.
Carnegie, Clean Coal Co., Bellaire, Ohio	do.	Appeal denied (application not made within 20 days).	
Haws No. 7, Haws Refractories Co., Johnstown, Pa.	do.	Appeal denied 8/10/53.	
Princess No. 2, Princess Elkhorn Coal Co., Permele, Ky.	do.	Order annulled 2/11/54.	
Do.	do.	Appeal denied 10/15/54.	Appealed 11/3/54; order annulled 1/28/55; appealed to Court; (Board decision affirmed 10/24/55).
Wheelwright, Inland Steel Co., Inc.,	do.	Appealed 1/7/55; denied 3/1/55.	Appealed 3/22/55; hearing 1/10/17/56; interlocutory order 4/10/56; order applied to No. 3 mine only 9/13/56.
Banner No. 2, Banner Fuel Corp., Cranes Nest, Va.	do.	Appealed 1/7/55; denied 3/28/55.	
Buchanan No. 4, Buchanan County Coal Corp. Big Rock, Va.	do.	Appealed 1/12/55; denied 1/20/55.	

1/ Blank space means appeal taken directly to Board.

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Mine and company	Reason for appeal	Disposition[1] Director	Board
No. 6, Caldonia Coal Co., Norton, Va.	Gassy classification	Hearing 3/4/55; appeal denied 3/11/55.	
No. 2, Harlan-Wallins Coal Corp. Evarts, Harlan County, Ky.	do.	Appealed 3/10/55; denied 5/11/55.	Appealed 5/13/55; denied 7/30/55.
Kildee No. 3, Pschirrer & Sons Coal Co., Canton, Ill.	do.	Appealed 3/22/55; order annulled 4/12/55.	
Portage No. 4, Miller Shaft Co., Portage, Pa.	do.	Appealed 4/25/56; order annulled 5/31/56.	
Rosedale No. 8 Rosedale Coal Co., Maidsville, W. Va.	do.	Appealed 11/15/56; denied 12/17/56.	Appealed 1/3/57; hearing 1/31/57; decision pending.
	Sec. 203(c) orders		
Talleydale, Snow Hill Coal Corp., Terre Haute, Ind.	Violation of sec. 209(d)(9).[2]	Order annulled 8/4/53.	Appealed for temporary relief 6/5/53; hearing 6/17/53, extending time for total abatement until 7/11/53.
Williams River No. 1, The Gauley Mountain Coal Co., Cowen, Webster County, W. Va.	do.		Appealed 1/3/55, based on 209(b); denied 3/16/55; affirmed by Court 7/30/55.
Cassity, Nos. 2, 3, and 6 openings, Three Fork Coal Co., Inc., Cassity, W. Va.	Violation of 209(e)(1).		Appealed 12/13/54; order annulled 3/4/55; Court dismissed appeal.
Crucible, Fuel Division, Crucible Steel Company of America, Crucible, Pa.	Violation 209(e)(5).		Appealed and relief granted 7/3/55; hearing 9/12-16/55; order annulled 11/23/55.
	Sec. 203(a) orders		
Kleaner No. 1, Kleaner Coal Co., Bokoshe, Okla.	Explosion danger		Appealed 9/27/53;[3] order annulled 10/2/53.
Starr No. 2, Starr Coal, Inc., Henryetta, Okla.	do.		Order annulled 2/14/55.[3]
Do.	do.		Order annulled 5/12/55.[3]

1/ Blank space means appeal taken directly to Board.
2/ Failed to test for gas before electrical equipment was taken beyond last open crosscut.
3/ State-participation plan in effect. No appeal to Director permitted.

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APPENDIX D

TABLE 1. - Number of active coal mines in the Nation, 1956

State	Title I mines			Title II mines	Total mines
	Strip	Underground	Total		
Alabama	38	267	305	29	334
Alaska	4	0	4	3	7
Arizona	0	2	2	0	2
Arkansas	5	17	22	5	27
California	0	0	0	0	0
Colorado	4	117	121	22	143
Georgia	0	6	6	0	6
Idaho	0	0	0	0	0
Illinois	54	47	101	44	145
Indiana	36	39	75	10	85
Iowa	19	30	49	3	52
Kansas	8	4	12	0	12
Kentucky	88	1,380	1,468	313	1,781
Maryland	19	52	71	5	76
Michigan	0	0	0	0	0
Missouri	9	15	24	8	32
Montana	19	49	68	3	71
New Mexico	2	44	46	2	48
North Carolina	0	0	0	0	0
North Dakota	58	9	67	0	67
Ohio	142	185	327	43	370
Oklahoma	11	13	24	5	29
Oregon	0	1	1	0	1
Pennsylvania (anthracite)	143	791	934	94	1,028
Pennsylvania (bituminous)	363	653	1,016	214	1,230
South Dakota	5	0	5	0	5
Tennessee	76	583	659	42	701
Texas	2	0	2	0	2
Utah	0	33	33	16	49
Virginia	25	900	925	122	1,047
Washington	1	13	14	8	22
West Virginia	83	1,431	1,514	544	2,058
Wyoming	10	12	22	6	28
Total	1,224	6,693	7,917	1,541	9,458

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TABLE 2. - Number of regular inspections, surveys, and miscellaneous investigations and inspections

Period	Field office	Regular inspections			Surveys					Investigations of injuries and disasters	Miscellaneous investigations	Spot-check inspections
		Original	Reinspections	Total	Electrical	Explosives	Ventilation	Float dust	Rock dusting			
1941-55	All	17,410	64,979	82,389	366	249	37	41	30	3,463	482	546
1956	Wilkes-Barre	318	842	1,160	0	0	0	0	0	84	60	171
	Pittsburgh	144	564	708	14	0	0	0	0	83	22	2
	Johnstown	153	665	818	12	0	0	0	0	51	13	8
	St. Clairsville	42	517	559	3	0	0	0	0	22	42	6
	Mount Hope	838	908	1,746	5	0	0	0	0	149	11	287
	Morgantown	89	645	734	0	0	0	0	4	52	6	125
	Norton	563	901	1,464	0	0	0	0	0	72	43	121
	Barbourville	341	713	1,054	0	0	0	0	0	44	1	81
	Birmingham	79	447	526	0	0	0	0	0	17	6	1
	Jellico	287	491	778	0	0	0	0	0	17	118	9
	Vincennes	58	545	603	5	0	1	0	0	68	52	57
	McAlester	4	88	92	0	0	1	0	0	3	16	17
	Denver	15	279	294	0	0	0	0	0	5	74	3
	Salt Lake City	3	124	127	2	0	0	0	0	9	5	1
	Phoenix	4	49	53	0	0	0	0	0	0	0	2
	Seattle	3	29	32	0	0	0	0	0	1	8	10
	Anchorage	0	6	6	0	0	0	0	0	0	2	3
	1956 total	2,941	7,813	10,754	48	0	2	0	4	677	479	904
	Grand total	20,351	72,792	93,143	414	249	39	41	34	4,140	1/961	1/1,450

1/ 1955 and 1956 only.

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TABLE 3. - Mines inspected, regular inspections, and average inspections per active mine, 1956

State	Mines inspected[1]				No. of inspections				Active mines in the Nation				Average inspections per active mine			
	A	B	C	Total	A	B	C	Total	A	B	C	Total	A	B	C	Total
Alabama	38	241	29	308	47	412	61	520	38	267	29	334	1.2	1.5	2.1	1.6
Alaska	1	0	3	4	1	0	5	6	4	0	3	7	.3	-	1.7	.9
Arizona	0	2	0	2	0	2	0	2	0	2	0	2	-	1.0	-	1.0
Arkansas	5	17	5	27	5	21	13	39	5	17	5	27	1.0	1.2	2.6	1.4
California	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-
Colorado	4	98	22	124	4	133	52	189	4	117	22	143	1.0	1.1	2.4	1.3
Georgia	0	5	0	5	0	6	0	6	0	6	0	6	-	1.0	-	1.0
Idaho	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-
Illinois	54	47	44	145	55	73	127	255	54	47	44	145	1.0	1.6	2.9	1.8
Indiana	35	29	10	74	35	36	35	106	36	39	10	85	1.0	.9	3.5	1.2
Iowa	16	13	3	32	16	13	7	36	19	30	3	52	.8	.4	2.3	.7
Kansas	8	2	0	10	8	2	0	10	8	4	0	12	1.0	.5	-	.8
Kentucky	44	931	313	1,288	44	1,016	751	1,811	88	1,380	313	1,781	.5	.7	2.4	1.0
Maryland	12	43	5	60	12	89	14	115	19	52	5	76	.6	1.7	2.8	1.5
Michigan	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-
Missouri	9	10	8	27	9	12	16	37	9	15	8	32	1.0	.8	2.0	1.2
Montana	8	36	3	47	8	46	4	58	19	49	3	71	.4	.9	1.3	.8
N. Mexico	2	42	2	46	2	56	5	63	2	44	2	48	1.0	1.3	2.5	1.3
N. Carolina	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-
N. Dakota	19	1	0	20	19	1	0	20	58	9	0	67	.3	.1	-	.3
Ohio	110	175	43	328	110	296	119	525	142	185	43	370	.8	1.6	2.8	1.4
Oklahoma	11	13	5	29	11	17	13	41	11	13	5	29	1.0	1.3	2.6	1.4
Oregon	0	1	0	1	0	1	0	1	0	1	0	1	-	1.0	-	1.0
Pennsylvania (anthracite)	108	722	90	920	108	804	248	1,160	143	791	94	1,028	.8	1.0	2.6	1.1
Pennsylvania (bituminous)	138	632	214	984	240	759	527	1,526	363	653	214	1,230	.7	1.2	2.5	1.2
S. Dakota	0	0	0	0	0	0	0	0	5	0	0	5	.0	-	-	.0
Tennessee	71	558	43	672	71	598	109	778	76	583	42	701	.9	1.0	2.6	1.1
Texas	2	0	0	2	2	0	0	2	2	0	0	2	1.0	-	-	1.0
Utah	0	33	16	49	0	60	47	107	0	33	16	49	-	1.8	1.9	2.2
Virginia	9	510	122	641	9	558	309	876	25	900	122	1,047	.4	.6	2.5	.8
Washington	1	10	7	18	1	16	14	31	1	13	8	22	1.0	1.2	1.8	1.4
W. Virginia	19	1,150	518	1,687	19	1,221	1,159	2,399	83	1,431	544	2,058	.2	.9	2.1	1.2
Wyoming	9	10	6	25	10	12	13	35	10	12	6	28	1.0	1.0	2.2	1.3
National data	733	5,331	1,511	[2]7,575	846	6,260	3,648	10,754	1,224	6,693	1,541	9,458	.7	.9	2.4	1.1

1/ A, Strip mines; B, Title I underground mines; C, Title II mines.
2/ Owing to intermittent operation or abandonment, it was impossible to inspect some mines.

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TABLE 4. - Average man-days to complete regular inspections and reports

State	Title I mines				Title II mines		All mines	
	Strip		Underground					
	A[1/]	B[2/]	A[1/]	B[2/]	A[1/]	B[2/]	A[1/]	B[2/]
Alabama	0.8	0.4	0.8	0.5	4.2	0.7	1.2	0.5
Alaska	1.0	1.0	-	-	3.0	.8	2.7	.8
Arizona	-	-	2.0	.5	-	-	2.0	.5
Arkansas	1.0	.6	1.6	1.0	4.3	1.5	2.4	1.1
California	-	-	-	-	-	-	-	-
Colorado	1.0	.5	1.2	.5	2.7	.8	1.6	.6
Georgia	-	-	.8	.3	-	-	.8	.3
Idaho	-	-	-	-	-	-	-	-
Illinois	1.4	.3	1.5	.4	5.9	.8	3.7	.6
Indiana	1.0	.7	1.4	.8	4.8	.9	2.4	.8
Iowa	1.1	.3	1.0	.5	1.1	.6	1.1	.4
Kansas	1.3	.5	1.5	.5	-	-	1.3	.5
Kentucky	1.2	.5	.7	.6	2.6	.7	1.5	.6
Maryland	.4	.7	.6	.5	1.1	.9	.6	.5
Michigan	-	-	-	-	-	-	-	-
Missouri	1.0	.3	1.0	.4	2.1	.5	1.5	.4
Montana	.8	.4	1.1	.6	3.0	1.3	1.2	.6
New Mexico	1.0	.5	1.1	.4	2.4	.6	1.2	.4
North Carolina	-	-	-	-	-	-	-	-
North Dakota	1.4	.5	2.0	1.0	-	-	1.5	.6
Ohio	1.2	.5	1.0	.7	3.5	.7	1.6	.7
Oklahoma	1.0	.6	1.4	.8	3.2	1.5	1.9	1.0
Oregon	-	-	3.0	1.0	-	-	3.0	1.0
Pennsylvania (anthracite)	.6	.5	1.1	.8	7.4	1.0	2.4	.8
Pennsylvania (bituminous)	.9	.7	.9	1.0	2.4	1.1	2.1	1.0
South Dakota	-	-	-	-	-	-	-	-
Tennessee	.7	.4	.7	.5	2.6	.8	1.0	.6
Texas	.3	1.0	-	-	-	-	.3	1.0
Utah	-	-	1.2	.5	3.9	.6	2.4	.5
Virginia	1.0	.7	1.0	.8	2.6	.8	1.6	.8
Washington	2.0	1.0	1.5	.4	3.9	.5	2.6	.5
West Virginia	.9	.8	.7	.4	3.9	.6	2.3	.5
Wyoming	1.3	.3	1.2	.5	3.4	.5	2.0	.5
National data	1.0	.6	.9	.6	3.5	.8	1.8	.7

1/ A - Average days to complete regular inspection. Includes inspection, travel, preparing and posting preliminary report, notices, or orders; conferences with mine personnel; and preparing notes and sample cards, excluding special inspections.

2/ B - Average days for inspector to prepare rough draft of inspection report.

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TABLE 5. - Special inspections and average man-days to complete an inspection, Title II mines, 1956

State	Special inspections			Regular inspections, title II mines[1/]	Average additional man-days per regular inspection	Average man-days per regular inspection[2/]	Average man-days per Title II inspection
	Number of inspections	Total man-days	Average man-days per special inspection				
Alabama	13	13	1.0	61	0.2	4.2	4.4
Alaska	1	3	3.0	5	.6	3.0	3.6
Arizona	0	-	-	0	-	-	-
Arkansas	2	12	6.0	13	.9	4.3	5.2
California	0	-	-	0	-	-	-
Colorado	52	52	1.0	52	1.0	2.7	3.7
Georgia	0	-	-	0	-	-	-
Idaho	0	-	-	0	-	-	-
Illinois	27	29	1.1	127	.2	5.9	6.1
Indiana	15	17	1.1	35	.5	4.8	5.3
Iowa	0	-	-	7	-	1.0	1.0
Kansas	0	-	-	0	-	-	-
Kentucky	362	376	1.0	751	.5	2.6	3.1
Maryland	1	1	1.0	14	.1	1.1	1.2
Michigan	0	-	-	0	-	-	-
Missouri	3	11	3.7	16	.7	2.1	2.8
Montana	1	31	31.0	4	7.8	3.0	10.8
New Mexico	0	-	-	5	-	2.4	2.4
North Carolina	0	-	-	0	-	-	-
North Dakota	0	-	-	0	-	-	-
Ohio	23	39	1.7	119	.3	3.5	3.8
Oklahoma	1	3	3.0	13	.2	3.2	3.4
Oregon	0	-	-	0	-	-	-
Pennsylvania (anthracite)	89	103	1.2	248	.4	7.4	7.8
Pennsylvania (bituminous)	85	73	.9	527	.1	2.4	2.5
South Dakota	0	-	-	0	-	-	-
Tennessee	34	33	1.0	109	.3	2.6	2.9
Texas	0	-	-	0	-	-	-
Utah	9	45	5.0	47	1.0	3.9	4.9
Virginia	170	153	.9	309	.5	2.6	3.1
Washington	1	3	3.0	14	.2	3.9	4.1
West Virginia	466	466	1.0	1,159	.4	3.9	4.3
Wyoming	0	-	-	13	-	3.4	3.4
National data, inspection work	1,355	1,463	1.1	3,648	.4	3.5	3.9
Average man-day to write inspection report[2/]							.8
Total average man-days per Title II mine							4.7

1/ See appendix D, table 3.

2/ See appendix D, table 4.

TABLE 6. - Comparative inspection data, Title II mines, 1953-56

Year	Regular inspections	Special inspections	Violations of Title II observed	Notices issued, form B	Orders issued	
					Form A	Form D
1953	3,664	3,622	7,928	3,593	36	138
1954	3,894	2,727	8,012	2,933	58	76
1955	3,484	2,360	8,701	2,177	80	69
1956	3,648	1,355	9,469	1,389	49	47

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APPENDIX E

Violations of Federal Mine Safety Codes

State	Title I underground mines				Title II mines			
	Mines inspected[1]	Violations observed[2]	Average violations per mine inspected	Mines free of violations	Mines inspected[1]	Violations observed[2]	Average violations per mine inspected	Mines free of violations
Alabama	241	6,588	27	0	29	200	7	7
Alaska	0	-	-	-	3	48	16	0
Arizona	2	9	5	0	0	-	-	-
Arkansas	17	607	36	0	5	164	33	0
California ...	0	-	-	-	0	-	-	-
Colorado	98	662	7	2	22	218	10	1
Georgia	5	97	19	0	0	-	-	-
Idaho	0	-	-	-	0	-	-	-
Illinois	47	846	18	0	44	829	19	3
Indiana	29	694	24	1	10	313	31	1
Iowa	13	341	26	0	3	48	16	0
Kansas	2	64	32	0	0	-	-	-
Kentucky	931	21,082	23	1	313	6,070	19	5
Maryland	43	1,049	24	0	5	120	24	0
Michigan	0	-	-	-	0	-	-	-
Missouri	10	221	22	-	8	182	23	1
Montana	36	305	9	0	3	22	7	1
New Mexico ...	42	259	6	0	2	16	8	0
North Carolina	0	-	-	-	0	-	-	-
North Dakota .	1	22	22	1	0	-	-	-
Ohio	175	4,724	27	0	43	1,210	28	0
Oklahoma	13	280	22	2	5	120	24	4
Oregon	1	3	3	0	0	-	-	-
Pennsylvania (anthracite).	722	7,481	10	3	90	1,235	14	2
Pennsylvania (bituminous).	632	11,543	18	0	214	4,017	19	5
South Dakota .	0	-	-	-	0	-	-	-
Tennessee	558	9,624	17	2	43	890	21	0
Texas	0	-	-	-	0	-	-	-
Utah	33	327	10	1	16	190	12	4
Virginia	510	5,598	31	0	122	3,646	30	2
Washington ...	10	68	7	0	7	49	7	0
West Virginia.	1,150	22,833	20	11	518	16,297	31	48
Wyoming	10	107	11	-	6	57	10	0
National data	5,331	105,434	20	24	1,511	35,941	24	84

1/ See appendix D, table 3.
2/ Includes all violations observed during first inspections in 1956 and all new violations observed during subsequent inspections.

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APPENDIX F

Violations of Federal Mine Safety Codes abated during inspections

State	Title I underground mines				Title II mines			
	Violations observed	Violations recorded in reports	Violations abated during inspections	Violations abated during inspections, percent	Violations observed	Violations recorded in reports	Violations abated during inspections	Violations abated during inspections, percent
Alabama	6,588	6,464	124	2	200	137	63	32
Alaska	-	-	-	-	48	0	48	100
Arizona	9	7	2	22	-	-	-	-
Arkansas	607	602	5	1	164	145	19	12
California ..	-	-	-	-	-	-	-	-
Colorado	662	499	163	25	218	95	123	56
Georgia	97	97	0	0	-	-	-	-
Idaho	-	-	-	-	-	-	-	-
Illinois	846	816	30	4	829	826	3	0
Indiana	694	685	9	1	313	209	104	33
Iowa	341	340	1	0	48	48	0	0
Kansas	64	63	1	2	-	-	-	-
Kentucky	21,082	19,669	1,413	8	6,070	4,580	1,490	25
Maryland	1,049	1,001	48	5	120	93	27	23
Michigan	-	-	-	-	-	-	-	-
Missouri	221	220	1	1	182	150	32	18
Montana	305	305	0	0	22	21	1	5
New Mexico ..	259	202	57	22	16	0	16	100
North Carolina	-	-	-	-	-	-	-	-
North Dakota.	22	22	0	0	-	-	-	-
Ohio	4,724	4,484	240	5	1,210	779	431	36
Oklahoma	280	280	0	0	120	108	12	10
Oregon	3	3	0	0	-	-	-	-
Pennsylvania (anthracite)	7,481	7,261	220	3	1,235	752	483	39
Pennsylvania (bituminoua)	11,543	10,698	845	7	4,017	2,394	1,623	40
South Dakota.	-	-	-	-	-		-	-
Tennessee ...	9,624	9,208	416	4	890	768	122	14
Texas	-	-	-	-	-	-	-	-
Utah	327	288	39	12	190	87	103	54
Virginia	15,598	14,737	861	6	3,646	2,738	908	25
Washington ..	68	66	2	3	49	47	2	4
West Virginia	22,833	20,445	2,388	10	16,297	8,906	7,391	45
Wyoming	107	94	13	12	57	12	45	79
National average..	105,434	98,556	6,878	7	35,941	22,895	13,046	36

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APPENDIX G

TABLE 1. - Title I mines at which no violations of the Federal Mine Safety Codes were observed during an inspection

1956		
State	Mine	Company
Alabama	Wyatt[1/]	Alabama Contracting Co.
Do.	Blackwell[1/]	H. C. Blackwell Trucking Co.
Do.	Davidson[1/]	Davidson Coal Co.
Do.	Marigold[1/]	Marigold Coal Co., Inc.
Do.	Sayre[1/]	Republic Steel Corp.
Do.	Robbins[1/]	Robbins Coal Co.
Do.	Hillard[1/]	T. and L. Coal Co.
Alaska	Usibelli[1/]	Usibelli Coal Mine, Inc.
Colorado	Grey Creek No. 6	Morasky Coal and Blocks.
Do.	New Castle Vulcan No. 3.	New Castle Coal Co.
Illinois	No. 1[1/]	Wyvan K Coal Co.
Indiana	Morgan	Morgan Coal Co.
Kansas	No. 19[1/]	Pittsburg & Midway Coal Mining Co.
Kentucky	B M and M[1/]	B M and M Coal Co.
Do.	Gibraltar	Gibraltar Coal Corp.
Do.	Osborne No. 2[1/]	Osborne Mining Co.
Montana	Rosebud open pit[1/]	Foley Brothers, Inc.
Do.	Toman[1/]	J. Fred Toman and R. K. Baukema, licensees and operators.
Do.	Two Tree[1/]	Antone U. Gali, lessee and operator.
Do.	Wolf Creek[1/]	Medicine Lake Coal Co.
Do.	Sterling[1/]	U. B. Sterling, licensee and operator.
North Dakota	Lehigh	Dakota Briquets and Tar Products, Inc.
Do.	Indian Head[1/]	Dakota Collieries Co.
Do.	Flemmer[1/]	Flemmer Coal Co.
Do.	Dakota Star[1/]	Truax-Traer Coal Co.
Ohio	Bradford No. 1[1/]	Hanna Coal Co.
Do.	Betsy[1/]	The Powhatan Mining Co.
Do.	Q and R[1/]	Q and R Coal Co.
Oklahoma	Daws No. 4	Daws Coal Co.
Do.	Burok	McAlester-Alderson Coal Co.
Pennsylvania (anthracite)	Conlon[1/]	C B M Coal Co.
Do.	Plains[1/]	Do.
Do.	No. 3 slope	C and G Coal Co.
Do.	Loomis Mammoth[1/]	Fabrizio Brothers.
Do.	Continental Primrose[1/]	Green Valley Coal Mining Co.
Do.	No. 30 slope[1/]	Kehoe-Berge Coal Co.
Do.	No. 56 slope	M and B Coal Co.
Do.	Orchard basin[1/]	Norman C. Schock.
Do.	No. 1 drift	Springfield Coal Co.
Pennsylvania (bituminous)	Marton auger[1/]	J. Russell Cravener.
Tennessee	No. 3 auger[1/]	Midway Coal Co.

1/ Strip mines.

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TABLE 1. - Title I mines at which no violations of the Federal Mine Safety Codes were observed during an inspection (Con.)

1956		
State	Mine	Company
Tennessee	No. 5 auger[1]	Midway Coal Co.
Do.	No. 3[1]	New Paint Rock Coal Co.
Do.	No. 4	Rufus Anderson Coal Co.
Do.	No. 3	State Training & Vocational School.
Utah	Knight	Knight-Ideal Coal Co.
West Virginia	No. 44	Beatrice and Walker Coal Co.
Do.	No. 42	Cline Coal Co.
Do.	No. 5	Fred Sheets Coal Co.
Do.	Kozar	Kozar Coal Co.
Do.	No. 6	Lonnie Woody Coal Co.
Do.	McClanahan	McClanahan Coal Co.
Do.	No. 4	SK Coal Co.
Do.	Spencer	Spencer Coal Co.
Do.	Spivy	Spivy Coal Co.
Do.	United Gas No. 1	Truax-Traer Coal Co.
Do.	No. 1	Wheeler Robinette Coal Co.
Wyoming	Welch[1]	Welch Coal Co.

1/ Strip mines.

TABLE 2. - Title II mines at which no violations of the Federal Mine Safety Codes were observed during an inspection

1956		
State	Mine	Company
Alabama	Maxine[1]	Alabama By-Products Corp.
Do.	Gorgas, No. 5 opening	Alabama Power Co.
Do.	Gorgas, No. 6 opening	Do.
Do.	Sayre[1]	Republic Steel Corp.
Do.	Sayreton No. 1[1]	Do.
Do.	Hamilton[1]	Tennessee Coal and Iron Division, United States Steel Corp.
Do.	Short Creek No. 19	Do.
Colorado	Frederick[1]	Colorado Fuel and Iron Corp.
Illinois	No. 9[1]	Old Ben Coal Corp.
Do.	East Breeze[1]	Citizens Coal Co.
Do.	Carmac[1]	Carmac Coal Co.
Indiana	White Ash[1]	White Ash Coal Co.
Kentucky	High Splint No. 1, Glen Brook colliery	Stonega Coke and Coal Co.
Do.	No. 204[1]	Consolidation Coal Co. (Ky.).
Do.	Price No. 1[1]	Inland Steel Co.
Do.	Price No. 2[1]	Do.
Do.	Wheelwright 1 and 2[1]	Do.
Missouri	Bradley[1]	D. L. Bradley Coal Co., Inc.
Montana	Montana Queen[1]	Mountain States Mining Co.
Oklahoma	Blackstone	Ben Hur Coal Co.
Do.	Carbon No. 5[1]	Lone Star Steel Co.

1/ Mines appear in tables 2 and 3.

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TABLE 2. - Title II mines at which no violations of the Federal Mine Safety Codes were observed during an inspection (Con.)

1956		
State	Mine	Company
Oklahoma	No. 14	Lone Star Steel Co.
Do.	No. 1[1/]	Poteau Coal Co.
Pennsylvania (anthracite)	No. 1-A slope[1/]	New Port Excavating Co.
Do.	No. 2[1/]	Do.
Pennsylvania (bituminous)	Springdale	Allegheny Pittsburgh Coal Co.
Do.	Oakmont	Harmar Coal Co.
Do.	Indianola[1/]	Republic Steel Corp.
Do.	Collier	United States Steel Corp.
Do.	Karen[1/]	Do.
Utah	Book Cliffs	Book Cliffs Coal Co.
Do.	Clear Creek	Independent Coal & Coke Co.
Do.	Wattis	Lion Coal Co.
Do.	King	United States Fuel Co.
Virginia	Crossbrook	Stonega Coke and Coal Co.
Do.	Derby colliery[1/]	Do.
West Virginia	No. 3	Cannelton Coal & Coke Co.
Do.	No. 9X	The Carbon Fuel Co.
Do.	Morris Creek	Central Appalachian Coal Co.
Do.	No. 4[1/]	Craigsville Coal and Coke Co.
Do.	East Gulf No. 7	C. H. Mead Coal Co.
Do.	Webb No. 3	Dorothy Coal Co., Inc.
Do.	Kopperston No. 2[1/]	Eastern Gas and Fuel Associates, Coal Division.
Do.	No. 10 Stotesbury	Do.
Do.	No. 11 Storesbury	Do.
Do.	Wharton No. 2	Do.
Do.	Alloy No. 2	Electro Metallurgical Co.
Do.	Hernshaw	Do.
Do.	Rich Run[1/]	Elk River Coal & Lumber Co.
Do.	Quinwood No. 2	Imperial Smokeless Coal Co.
Do.	Island Creek No. 1	Island Creek Coal Co.
Do.	No. 17 Bottom	Do.
Do.	No. 1	Lew Jean Coal Co.
Do.	No. 5	L. L. and M. Coal Co.
Do.	Milburn	Milburn By-Products Coal Co.
Do.	Sterling Sewell	Mt. Hope Coal Co.
Do.	Olga No. 1	Olga Coal Co.
Do.	Olga No. 2	Do.
Do.	No. 4[1/]	Open Fork Fuel Co.
Do.	No. 11[1/]	Page Coal & Coke Co.
Do.	Page[1/]	Do.
Do.	No. 1[1/]	Perkins Coal Co.
Do.	No. 1	Perkins and Fite Coal Co.
Do.	Itmann	Pocahontas Fuel Co., Inc.
Do.	Pocahontas No. 7	Do.
Do.	No. 5	Scott Coal Co.
Do.	No. 4[1/]	S. K. Coal Co.
Do.	Acme No. 2 block	Truax-Traer Coal Co.
Do.	No. 3	Do.

1/ Mines appear in tables 2 and 3.

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TABLE 2. - Title II mines at which no violations of the Federal Mine Safety Codes were observed during an inspection (Con.)

1956		
State	Mine	Company
West Virginia	No. 4	Truax-Traer Coal Co.
Do.	No. 6	Do.
Do.	Shamrock No. 1	Do.
Do.	United Gas No. 1	Do.
Do.	United No. 2	Do.
Do.	No. 2	United States Steel Corp.
Do.	No. 6	Do.
Do.	No. 9[1/]	Do.
Do.	No. 10	Do.
Do.	No. 14, No. 3 seam portal	Do.
Do.	VC No. 3	Valley Camp Coal Co.
Do.	VC No. 10[1/]	Do.
Do.	No. 1[1/]	Wilpen Coal Co.
Do.	Sewell Chief	Woolridge Coal Mining Co.
Do.	Dehue	Youngstown Mines Corp.

1/ Mines appear in tables 2 and 3.

TABLE 3. - Title II mines at which no imminent dangers (sec. 203(a)) or violations of sec. 209 under Title II were observed during an inspection

1956		
State	Mine	Company
Alabama	Maxine[1/]	Alabama By-Products Corp.
Do.	Labuco	Do.
Do.	Blockton No. 9	Black Diamond Coal Mining Co.
Do.	Empire No. 3	DeBardeleben Coal Corp.
Do.	Bell Ellen No. 9	Hicks Coal Co.
Do.	No. 2	G. M. Phillips.
Do.	Sayre[1/]	Republic Steel Corp.
Do.	Sayreton No. 1[1/]	Do.
Do.	Hamilton[1/]	Tennessee Coal and Iron Division, United States Steel Corp.
Do.	Concord No. 1	Do.
Alaska	Jonesville	Evan Jones Coal Co.
Do.	Rosalie No. 1	Usibelli Coal Mine, Inc.
Arkansas	Jewel	Jewel Mining Company.
Colorado	Allen	Colorado Fuel and Iron Corp.
Do.	Frederick[1/]	Do.
Do.	Harris	The Colorado & Utah Coal Co.
Do.	Hawk's Nest	Champion Coal Mining Co.
Do.	Imperial	Imperial Coal Co.
Do.	Keystone	Keystone Mining Corp.
Illinois	No. 1	B. and W Coal Co.
Do.	Ziegler No. 3	Bell and Zoller Coal Co.
Do.	Bell Valley	Bell Valley Coal Co.
Do.	New Black Crystal	Black Crystal Coal Co.
Do.	Bois	Bois Coal Co.

1/ Mines appear in tables 2 and 3.

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TABLE 3. - Title II mines at which no imminent dangers (sec. 203(a)) or violations of sec. 209 under Title II were observed during an inspection (Con.)

1956		
State	Mine	Company
Illinois	North	Breese Coal Co.
Do.	Alpha	Bugos-White Coal Co.
Do.	Carmac[1]	Carmac Coal Co.
Do.	Cherry Hill	Cherry Hill Coal Co.
Do.	East Breese[1]	Citizens Coal Co.
Do.	No. 1	Elk Coal Co.
Do.	Green Diamond	Mid-Continent Coal Corp.
Do.	No. 9[1]	Old Ben Coal Corp.
Do.	No. 2	Parton Coal Co.
Do.	Kildee No. 3	Pschirrer and Sons Coal Co.
Do.	No. 5	Sahara Coal Co., Inc.
Do.	No. 16	Do.
Do.	Schubert No. 1	Schubert Coal Co.
Do.	Burning Star drift	Truax-Traer Coal Co.
Do.	Virden	Virden Mining Corp.
Indiana	Enoco collieries	Enoco Collieries, Inc.
Do.	Minnehaha	Fairview Collieries Corp.
Do.	Ditney Hill	Ingle Coal Corp.
Do.	Pandora	Pandora Coal Corp.
Do.	Kings	Princeton Mining Co.
Do.	White Ash[1]	White Ash Coal Co.
Iowa	D. C.	D. C. Coal Co.
Do.	New Sterling No. 3	Sunshine Coal Co.
Do.	No. 4	Do.
Kentucky	Balkan	Balkan Coal Co.
Do.	Rockhouse No. 1	Bertley and Blevins Coal Co.
Do.	Beard	Beard Coal Co.
Do.	No. 13	Bell and Zoller Coal Co.
Do.	No. 14	Do.
Do.	No. 1	Big Jake Coal Co.
Do.	No. 5-A	Blue Diamond Coal Co.
Do.	No. 2	Boldman Fuel Co., Inc.
Do.	Hillier No. 2	Caudill-Ward Coal Co.
Do.	Clover Fork	Clover Fork Coal Co.
Do.	Pacemaker	Congleton Brothers Coal Co.
Do.	Hendrix	Consolidation Coal Co. (Ky.)
Do.	No. 204[1]	Do.
Do.	Left Fork	Cranks Creek Left Fork Coal Co.
Do.	Dawson collieries	Dawson Collieries, Inc.
Do.	DeKoven	DeKoven Coal Mining Co.
Do.	Cedar Grove No. 9	Emperor Coal Co., Inc.
Do.	No. 3	Everedge Coal Co.
Do.	No. 1	Franklin Coal Co.
Do.	No. 2	Fred G. Morgan Coal Co.
Do.	Wallins	Harlan Fuel Co.
Do.	No. 3	Harlan-Wallins Coal Corp.
Do.	No. 2	Hill Gail Coal Co.
Do.	Lenarue	Imperial Harlan Coal Co.
Do.	Price No. 1[1]	Inland Steel Company.

1/ Mines appear in tables 2 and 3.

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TABLE 3. - Title II mines at which no imminent dangers (sec. 203(a)) or violations of sec. 209 under Title II were observed during an inspection (Con.)

1956		
State	Mine	Company
Kentucky	Price No. 2[1/]	Inland Steel Company.
Do.	Wheelwright 1 and 2[1/]	Do.
Do.	Wisconsin Steel No. 1	International Harvester Co.
Do.	Wisconsin Steel No. 2	Do.
Do.	Joyce	Joyce Coal Company.
Do.	Wallins	Kentucky Cardinal Coal Corp.
Do.	Wallins No. 5	Do.
Do.	Kirk No. 5	Kirk Coal Mining Co.
Do.	Thacker	Leckie Collieries Co.
Do.	No. 3	Liberty Coal Co.
Do.	No. 1	Looney Coal Co.
Do.	No. 3	Luke Walters Coal Co.
Do.	No. 7	Mary Gail Coal Co.
Do.	Green River	Melton Coal Co.
Do.	No. 3	Middle Point Coal Co.
Do.	No. 4	Do.
Do.	Mill Ridge	Mill Ridge Coal Co.
Do.	Crescent	Nashville Coal, Inc.
Do.	No. 4	Peem Coal Co.
Do.	No. 3-A	Russell Fork Coal Co., Inc.
Do.	Laviers No. 2	South-East Coal Co.
Do.	No. 16	Stearns Coal & Lumber Co.
Do.	No. 18	Do.
Do.	No. 1	Susie Ann Coal Co.
Do.	No. 31	United States Steel Corp.
Do.	No. 32	Do.
Do.	No. 1	Wallace Valley Coal Co.
Do.	South Hill	Williams Brothers Mining Co., Inc.
Do.	Williams Bros.	Do.
Maryland	Susann No. 1	Myers Coal Co.
Do.	Deep Creek	Stanley Coal Co., Inc.
Do.	No. 3	W. and W. Coal Co.
Missouri	Macey	Ashford Coal Co.
Do.	Baiotto	Billy Creek Coal Co.
Do.	Blacksmith	Blacksmith Coal Co., Inc.
Do.	No. 4	Clark Coal Co.
Do.	Bradley[1/]	D. L. Bradley Coal Co.
Do.	Ol' Elliott	Moberly Fuel Co., Inc.
Do.	Klondike	Mosby Coal Co., Inc.
Do.	No. 8	No. 8 Coal Co.
Montana	Montana Queen[1/]	Mountain States Mining Co.
Do.	Klein No. 2	Republic Coal Co.
Do.	Roundup No. 3	The Roundup Mining Co.
New Mexico	Koehler	Kaiser Steel Corp.
Ohio	No. 57	Oskey Coal Co.
Do.	Betsy No. 3	The Powhatan Mining Co.
Do.	White Ash No. 3	Sickler Coal Mining Co.
Do.	Stillwater	Stillwater Clay Products Co.

1/ Mines appear in tables 2 and 3.

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TABLE 3. - Title II mines at which no imminent dangers (sec. 203(a)) or violations of sec. 209 under Title II were observed during an inspection (Con.)

1956		
State	Mine	Company
Oklahoma	Carbon No. 5 1/	Lone Star Steel Co.
Do.	No. 1 1/	Poteau Coal Co.
Pennsylvania (anthracite)	No. 41 slope	Adonizio Bros., Inc.
Do.	Bar-B	Bar-B Mining Co.
Do.	Kirmar slope	Biscontini and Sons Coal Co.
Do.	No. 1 Vein slope	Do.
Do.	Top Split Mammoth slope.	Bush Coal Co.
Do.	Monitor drift	C. and K. Coal Co.
Do.	Capone colliery	Sam Capone Coal Co.
Do.	Centralia colliery	Coates Coal Co.
Do.	Continental slope	The Continental-Archbald Coal Co.
Do.	No. 3 slope	Dancott Coal Co.
Do.	Diamond No. 15 slope	Diamond Colliery Co.
Do.	No. 60 slope	DiMario Coal Co.
Do.	Hunter tunnel	Drift Contracting Co.
Do.	No. 1	The Five-Par Coal Co.
Do.	No. 30 Drift	Gianforcaro Coal Co.
Do.	Powderly	Gillen Coal Mining, Inc.
Do.	Audenried colliery	Glen Alden Corp.
Do.	Avondale colliery	Do.
Do.	Buttonwood colliery	Do.
Do.	Kidder slope, Empire-Kidder colliery	Do.
Do.	Huber colliery	Do.
Do.	Empire No. 4 shaft, Empire-Kidder colliery.	Do.
Do.	Lance colliery	Do.
Do.	South Wilkes-Barre colliery	Do.
Do.	No. 18 mine, Wanamie colliery	Do.
Do.	No. 19 mine, Wanamie colliery	Do.
Do.	Sugar Notch colliery	Do.
Do.	No. 80 slope	Gravine Coal Co.
Do.	Greenbury drift	Greenbury Drift Coal Co.
Do.	Boston mine, Loree colliery	The Hudson Coal Co.
Do.	No. 3 mine, Loree colliery	Do.
Do.	No. 5 mine, Loree colliery	Do.
Do.	Eddy Creek colliery	Do.
Do.	Owl Hole mine, Eckley colliery	Jeddo-Highland Coal Co.
Do.	Stockton colliery, No. 3 slope	Do.
Do.	River slope	Knox Coal Co., Inc.

1/ Mines appear in tables 2 and 3.

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TABLE 3. - Title II mines at which no imminent dangers (sec. 203(a)) or violations of sec. 209 under Title II were observed during an inspection (Con.)

1956		
State	Mine	Company
Pennsylvania (anthracite)..	Schooley colliery	Knox Coal Co., Inc.
Do.	Breaker slope	L. and S. Coal Co.
Do.	Red Ash	Larksville Coal Co.
Do.	Enterprise slope, Henry colliery	Lehigh Valley Coal Co.
Do.	Dorrance colliery	Do.
Do.	Wyoming No. 8 slope, Henry colliery	Do.
Do.	Nos. 20 and 9 slopes ...	Leoni Coal Co.
Do.	Nos. 2, 3, and 4 mines, Packer colliery	Locust Creek Coal Co., Inc.
Do.	Maffei slope	Maffei Coal Co., Inc.
Do.	Fuller slope	Maltby Coal Co.
Do.	No. 17 slope	Mazzoni Coal Co.
Do.	No. 1-A slope[1/]	Newport Excavating Co.
Do.	No. 2 slope[1/]	Do.
Do.	No. 2-A slope	Do.
Do.	No. 3 slope	Do.
Do.	No. 52 slope	No. 52 Slope Coal Co., Inc.
Do.	No. 10 slope	Northwest Coal Co., Inc.
Do.	No. 2 slope	P. and J. Coal Co.
Do.	No. 14 colliery	Number 14 Coal Co.
Do.	Peca shaft	Peca Coal Co.
Do.	No. 3 tunnel	Penag Coal Co.
Do.	No. 14 drifts	Plains-Hilldale Coal Co.
Do.	No. 11 slope	Ploskonka Coal Co.
Do.	Nos. 14 and 44 tunnels mines	Do.
Do.	East Boston	Pringle Coal Co.
Do.	Renninger colliery	Renninger Coal Co.
Do.	Bell Mountain slope	Rogers Brothers.
Do.	Rogers Bros. Archbald slope No. 184	Do.
Do.	Spearhead	Spearhead Mining Co., Inc.
Do.	Underwood slope	Village Slope Coal Co.
Do.	West Cameron	West Cameron Coal Co., Inc.
Do.	No. 15 slope	West Exeter Coal Mining Co.
Do.	Hyde Park	West Slope Coal Corp.
Do.	Winnie Slope	Winnie Land Co., Inc.
Pennsylvania (bituminous)..	Frogtown	Allaman Mining Co.
Do.	No. 8	"B" Quality Coal Co.
Do.	Lancashire No. 15	Barnes and Tucker Co.
Do.	Susanna	Biggies Coal Co.
Do.	Pennsy	Bowie Coal Co.
Do.	Aurora No. 6	Bradford Coal Co.
Do.	Love No. 4	Bumble Bee Coal Co.
Do.	Springfield No. 6	Cambria-Clearfield Mining Co.
Do.	Cambria No. 4	Cambria Fuel Co.
Do.	Creighton	Creighton Coalworks, Inc.

1/ Mines appear in tables 2 and 3.

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TABLE 3. - Title II mines at which no imminent dangers (sec. 203(a)) or violations of sec. 209 under Title II were observed during an inspection (Con.)

1956		
State	Mine	Company
Pennsylvania (bituminous)..	Peerage No. 2	D & T Coal Co.
Do.	Springer	Eberly Coal and Coke Co.
Do.	Friel No. 6	Friel Coal Mining Co.
Do.	Coyer No. 3	I. E. and Walter Coyer Coal Co.
Do.	Cardiff No. 1	Imperial Coal Corp.
Do.	Beaver Run	Johnstown Coal and Coke Co.
Do.	Kniseley No. 10	Kniseley Coal Co.
Do.	Wynn	Korona Coal Co.
Do.	Oliphant	Laurel Enterprises, Inc.
Do.	Park-Armstrong	Leechburg Mining Company.
Do.	Loyal Hanna No. 6	Loyal Hanna Coal and Coke Co.
Do.	Sapper	McGee Coal Co.
Do.	Maxton slope No. 1	The Morrisdale Coal Mining Co.
Do.	No. 1	North Sewickley Coal Co.
Do.	No. 1	Patton Clay Manufacturing Co.
Do.	Ponfeigh Pine Hill	Pine Hill Smokeless Coal Co.
Do.	Reitz No. 3 lower	Reitz Coal Co.
Do.	Reitz No. 5	Do.
Do.	Indianola[1/]	Republic Steel Corp.
Do.	Johnson	Sager Coal Co.
Do.	Riddle	Sarver Coal Co.
Do.	Harrison No. 2	The Saxman Coal and Coke Co.
Do.	North Point	St. Marys Sewer Pipe Co.
Do.	Troxell No. 2	Scott Brothers Coal Co.
Do.	Mount Pleasant	Scottdale Connellsville Coal and Coke Co., Inc.
Do.	No. 6	Sekora's Coal.
Do.	Whitney	Stewart Coal and Coke Co.
Do.	Swank No. 6	Hiram Swank's Sons Co.
Do.	Karen[1/]	United States Steel Corp.
Do.	Viaduct No. 2	Viaduct Coal Mining Co.
Do.	Knickerbocker No. 4	Wilbur Coal Mining Co.
Do.	Orchard No. 5	Woolridge Coal Co.
Do.	Lincoln No. 1	Joseph E. Yobbagy.
Tennessee	P. No. 2	Ace Mining Co.
Do.	Hickey	Block Coal and Coke Corp.
Do.	Nos. 62 and 63	Brewer and Coffelt Coal Co.
Do.	No. 7	Fentress Coal & Coke Co.
Do.	No. 1	Kirkwood Fuel Co.
Do.	Martin No. 2	Martin Coal Co.
Do.	No. 1	McGhee Coal Co.
Do.	ABC	Meadow Creek Coal Co.
Do.	No. 65	Dennis Morrison Coal Co.
Do.	Nos. D-205 and D-208 ...	Oak Coal Co.
Do.	Bumbee	Pipes Brothers Coal Co.
Do.	R. C. No. 28	Horace Scisson Coal Co.
Do.	Trimore	Pocahontas Fuel Co.
Virginia	No. 1	C. A. Smith Mining Co.
Do.	No. 5-B	Castle Coal Co.

1/ Mines appear in tables 2 and 3.

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TABLE 3. - Title II mines at which no imminent dangers (sec. 203(a)) or violations of sec. 209 under Title II were observed during an inspection (Con.)

1956		
State	Mine	Company
Virginia	Moss No. 1	Clinchfield Coal Corp., Div. of the Pittston Co.
Do.	Moss No. 2	Do.
Do.	No. 5	Do.
Do.	Meade No. 2	Do.
Do.	Moss No. 3	Do.
Do.	Moss No. 4	Do.
Do.	No. 56	Do.
Do.	No. 2 South	Crockett & McCoy Coal Co.
Do.	No. 1	Fears, Jones & Eaves Co., Inc.
Do.	No. 5	Hi-Grade Coal Co.
Do.	No. 4	Sauls Coal Co.
Do.	No. 1	Southwestern Virginia Coal Corp.
Do.	Derby colliery[1/]	Stonega Coke and Coal Co.
Do.	Roda No. 3	Do.
Do.	Virginia-Lee	Virginia-Lee Co., Inc.
Do.	No. 4	Wise Coal and Coke Co.
Washington	Franklin No. 10	Palmer Coking Coal Co., Inc.
Do.	Landsburg	Do.
Do.	No. 4	Roslyn-Cascade Coal Co.
West Virginia	Crane Creek No. 1	The American Coal Co. of Alleghany County.
Do.	Piedmont	Do.
Do.	David No. 3	Arthurdale Mining Co.
Do.	Bakers Ridge No. 5	Bakers Ridge Coal Co.
Do.	No. 1	Bellburn Fuel Co.
Do.	No. 44	Bethlehem Mines Corp.
Do.	Betty Paige	Betty Paige Smokeless Coal Co.
Do.	No. 2	Blue Ridge Coal Corp.
Do.	No. 2	Brenneman Coal Co.
Do.	Henshaw	Brown Fuel Co.
Do.	Hemlock	Cedar Creek Coal Co.
Do.	Junior No. 67	Clark Coal Co.
Do.	No. 4[1/]	Craigsville Coal Co.
Do.	Kopperston No. 2[1/]	Eastern Gas and Fuel Assoc., Coal Division.
Do.	Rich Run[1/]	Elk River Coal Co.
Do.	No. 3	Fox Coal Co.
Do.	Frances	Frances Mining Co.
Do.	No. 1	Gray Eagle Coal Co.
Do.	No. 4	Haller Coal Co.
Do.	Orchard Fork	Hickman Coal Co.
Do.	Quinwood No. 3	Imperial Smokeless Coal Co.
Do.	Industrial No. 14	Industrial Coal Co.
Do.	Coal Mountain No. 9	Island Creek Coal Co.
Do.	Coal Mountain No. 12	Do.
Do.	Virginia	Johnson Coal Co.
Do.	Konya	Konya Coal Co.
Do.	Ream No. 1	Kray Coal Co., Inc.

1/ Mines appear in tables 2 and 3.

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TABLE 3. - Title II mines at which no imminent dangers (sec. 203(a)) or violations of sec. 209 under Title II were observed during an inspection (Con.)

1956		
State	Mine	Company
West Virginia	Ream No. 2	Kray Coal Co., Inc.
Do.	Ream No. 3-B	Do.
Do.	Ream No. 18	Do.
Do.	Lynn	Lake Lynn Fuel Co.
Do.	Lockview No. 2	Lockview Coal Co.
Do.	Nixon Nos. 4 and 5 openings	Nixon Coal Co.
Do.	No. 4[1/]	Open Fork Coal Co.
Do.	No. 11[1/]	Page Coal and Coke Co.
Do.	Page[1/]	Do.
Do.	Bergoo Nos. 4 and 4B openings	Pardee and Curtin Lumber Co.
Do.	No. 1	Perkins Coal Co.
Do.	No. 1	Pine Swamp Mining Co.
Do.	No. 1	Premium Coals, Inc.
Do.	Bull Run No. 2	Preston County Coke Co.
Do.	Bull Run No. 3	Do.
Do.	Burton	Richwood Sewell Coal Co.
Do.	Deep Hollow	Rithbell Coal Corp.
Do.	No. 4	S. K. Coal Co.
Do.	Carolyn No. 4	Sandy Creek Fuel Corp.
Do.	No. 1	Shaffer Coal Co.
Do.	No. 1	Sisler Coal Co.
Do.	No. 2	Smith Coal Co.
Do.	Snook	Snook Mining Co.
Do.	No. 2	Stoney River Coal Co.
Do.	No. 5[1/]	Terry Eagle Coal Co.
Do.	No. 5 Block	Truax-Traer Coal Co.
Do.	No. 9[1/]	United States Steel Corp.
Do.	VC No. 3[1/]	Valley Camp Coal Co.
Do.	No. 1[1/]	Wilpen Coal Co.
Do.	Beech Bottom	Windsor Power House Coal Co.
Do.	No. 2	Yale Mining Co.
Wyoming	Rainbow No. 6	Gunn-Quealy Coal Co.
Do.	D. O. Clark	The Union Pacific Coal Co.
Do.	Stansbury	Do.

1/ Mines appear in tables 2 and 3.

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APPENDIX H

Safety-education training of mine personnel, 1956

State	CMAPC for Miners		CMAPC for Supervisors	Haulage safety course	Roof-control course	Electrical safety course	Safety-lamp training	First-aid training	Mine rescue training
	Initial	Supplemental							
Alabama	86	29	22	498	498	0	0	0	0
Alaska	0	0	0	0	0	0	0	13	13
Arizona	0	0	0	10	16	0	0	72	0
Arkansas	0	0	14	0	256	0	0	0	0
California ...	0	0	0	0	0	0	0	0	0
Colorado	299	24	0	42	2,172	0	0	464	26
Georgia	0	0	0	0	0	0	0	0	0
Idaho	0	0	0	0	0	0	0	0	0
Illinois	828	0	0	100	100	0	38	229	6
Indiana	0	0	0	0	0	0	0	375	23
Iowa	0	0	0	0	0	0	0	0	9
Kansas		0	0	0	0	0	0	0	0
Kentucky	959	0	0	774	3,432	0	0	1,659	94
Maryland	0	0	0	0	718	0	0	194	0
Michigan	0	0	0	0	0	0	0	0	0
Missouri	0	0	0	0	0	0	0	49	36
Montana	0	0	0	0	109	0	0	56	0
New Mexico ...	0	0	0	124	301	0	0	548	0
New York	0	0	23	0	0	0	0	135	68
North Carolina	0	0	0	0	0	0	0	0	0
North Dakota .	0	0	0	0	4	0	0	0	0
Ohio	801	0	0	67	7,058	0	0	448	0
Oklahoma	0	0	0	0	0	0	0	21	0
Oregon	0	0	0	0	0	0	0	84	0
Pennsylvania (anthracite)	0	0	0	0	31,317	0	557	257	5
Pennsylvania (bituminous)	3,691	1,840	0	451	860	0	0	1,051	22
South Dakota .	0	0	0	0	0	0	0	0	0
Tennessee	133	1	0	7,219	8,437	0	0	105	1
Texas	0	0	0	0	0	0	0	0	0
Utah	254	0	0	145	145	0	254	36	0
Virginia	844	180	0	1,786	5,833	0	0	1,224	6
Washington ...	3	36	0	0	0	0	0	71	0
West Virginia.	10,183	833	0	0	17,803	0	0	2,796	139
Wyoming	220	0	0	105	131	0	220	5	0
Total	18,301	2,943	59	11,321	79,190	0	1,069	9,892	448

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Miscellaneous special assignments

Type of assignment	Wilkes-Barre, Pa.	Pittsburgh, Pa.	Johnstown, Pa.	St. Clairsville, Ohio	Mount Hope, W. Va.	Morgantown, W. Va.	Norton, Va.	Barbourville, Ky.	Birmingham, Ala.	Jellico, Tenn.	Vincennes, Ind.	McAlester, Okla.	Denver, Colo.	Salt Lake City, Utah	Phoenix, Ariz.	Seattle, Wash.	Anchorage, Alaska	Totals
Investigating auxiliary fans	0	0	0	0	0	0	0	0	1	0	4	0	0	2	0	0	0	7
Investigating mine fires, gas and dust ignitions, and other accidents	0	0	0	7	1	2	0	2	1	1	2	1	1	4	1	0	0	23
Investigating noncoal-mine accidents	0	1	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	4
Safety inspections noncoal mines and tunnels	1	3	0	1	0	0	0	0	0	0	0	0	0	2	13	5	0	25
Work on outcrop and abandoned-mine fires	0	0	0	1	0	0	0	0	0	0	0	0	6	0	0	0	0	7
Assisting in recovery of sealed fire areas	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2
Participating in legal litigations	0	1	0	0	0	1	0	3	0	2	0	0	0	0	0	0	0	7
Escorting visitors to mines and plants	2	9	6	0	1	2	0	0	0	0	0	0	3	5	0	0	0	28
Attending safety meetings	95	427	5	0	0	64	0	0	9	1	39	18	14	0	0	0	0	672
Officiating at first-aid and mine rescue contests.	1	11	0	0	0	11	0	0	4	1	5	0	1	0	0	0	0	34
Conferences with representatives of State and industry	0	15	0	0	0	0	0	0	1	0	38	5	4	0	0	0	0	63
Conferences with manufacturers of safety equipment	0	2	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	6
Special assignments for other Federal agencies	0	0	0	0	0	0	0	0	2	0	0	2	6	0	0	0	0	10
Safety demonstrations and lectures	7	2	1	0	0	3	0	0	5	0	21	5	1	1	0	0	40	86
Airborne dust studies	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
Revision of Bureau publications	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Assisting State departments	0	1	0	0	0	0	0	0	2	2	0	0	1	1	0	0	0	7
Electrical studies	0	5	0	1	1	1	0	0	0	0	2	0	4	0	0	0	0	14
Investigating abandoned gas wells	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Study of incombustible hydraulics fluids	0	1	0	0	0	0	0	0	1	0	1	0	1	1	0	0	0	5
Haulage study	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Mine-drainage study	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Investigating methane buildup in kerfs	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Investigating coal bumps	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	2
Investigating pollution of public water supply	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Miscellaneous	0	2	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	4

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APPENDIX J

TABLE 1. - Number of injuries and rates per million man-hours exposure (portal to portal)

Period[1/]	Fatal	Nonfatal	Man-hours	Rate		Change, percent			
				Fatal	Nonfatal	Fatal	Rate	Nonfatal	Rate
Anthracite									
1932-41	2,295	151,299	1,428,093,979	1.61	105.94				
1942-51	1,537	110,234	1,374,622,564	1.12	80.19	-33	-30	-27	-24
1952-56[2/] ...	340	19,798	299,651,940	1.13	66.07				
Bituminous									
1932-41	10,036	447,139	6,794,840,163	1.48	65.81				
1942-51	8,889	416,646	7,496,573,667	1.19	55.58	-11	-20	-7	-16
1952-56[2/] ...	1,926	90,937	2,008,250,123	.96	45.28				

1/ Calendar years.
2/ Figures for 1955-56 are preliminary

TABLE 2. - Number of fatal and nonfatal injuries and injuries per million man-hours exposure, portal to portal, in coal mines in the United States

Calendar year	Fatal injuries						Nonfatal injuries					
	Bituminous		Anthracite		Total		Bituminous		Anthracite		Total	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
1932 ...	958	1.77	249	1.59	1,207	1.73	39,352	72.58	16,931	107.88	56,283	80.50
1933 ...	833	1.31	231	1.49	1,064	1.34	43,946	68.87	15,183	98.13	59,129	74.58
1934 ...	958	1.41	268	1.50	1,226	1.43	46,982	69.39	18,577	104.15	65,559	76.63
1935 ...	968	1.46	274	1.78	1,242	1.52	47,529	71.47	15,897	103.16	63,426	77.43
1936 ...	1,098	1.43	244	1.56	1,342	1.45	50,514	65.62	17,026	108.80	67,540	72.91
1937 ...	1,198	1.54	215	1.58	1,413	1.55	52,847	68.05	13,412	98.72	66,259	72.62
1938 ...	880	1.52	225	1.94	1,105	1.59	36,794	63.47	12,842	110.85	49,636	71.36
1939 ...	867	1.36	211	1.71	1,078	1.42	38,544	60.52	13,229	107.37	51,773	68.12
1940 ...	1,204	1.68	184	1.50	1,388	1.65	43,994	61.28	13,782	112.55	57,776	68.75
1941 ...	1,072	1.35	194	1.49	1,266	1.37	46,637	58.93	14,420	110.83	61,057	66.26
1942 ...	1,245	1.41	226	1.64	1,471	1.44	53,193	60.21	13,581	98.73	66,774	65.40
1943 ...	1,225	1.39	226	1.50	1,451	1.40	51,067	57.79	13,527	89.68	64,594	62.44
1944 ...	1,124	1.23	174	1.06	1,298	1.20	51,253	56.02	12,438	76.05	63,691	59.06
1945 ...	925	1.13	143	1.01	1,068	1.11	46,194	56.52	10,923	77.32	57,117	59.58
1946 ...	795	1.09	173	1.14	968	1.10	42,817	58.81	12,533	82.65	55,350	62.93
1947 ...	985	1.23	173	1.18	1,158	1.22	46,025	57.32	11,635	79.41	57,660	60.72
1948 ...	862	1.15	137	.91	999	1.11	42,078	56.28	11,394	75.69	53,472	59.53
1949 ...	494	.93	91	.83	585	.91	27,548	51.67	7,857	71.88	35,405	55.11
1950 ...	550	.92	93	.80	643	.90	28,390	47.73	8,874	76.14	37,264	52.38
1951 ...	684	1.16	101	.95	785	1.13	28,081	47.56	7,472	69.94	35,553	50.99
1952 ...	449	.90	99	1.03	548	.92	23,719	47.64	6,355	66.35	30,074	50.66
1953 ...	397	.89	64	.92	461	.90	20,112	45.26	4,146	59.85	24,258	47.23
1954 ...	334	.99	62	1.23	396	1.02	14,746	43.66	2,972	59.18	17,718	45.67
1955[1/]..	357	.99	60	1.47	417	1.04	16,540	45.94	3,030	74.21	19,570	48.82
1956[1/] .	389	1.06	55	1.26	444	1.08	15,820	42.96	3,295	75.68	19,115	46.42

1/ Preliminary data, subject to revision.

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TABLE 3. - Major coal-mine disasters in the United States and number of persons killed

Calendar year	Major disasters	Persons killed	Calendar year	Major disasters	Persons killed
1932	6	145	1945	5	68
1933	1	7	1946	2	27
1934	2	22	1947	6	179
1935	4	35	1948	6	49
1936	5	37	1949	0	0
1937	6	101	1950	0	0
1938	6	84	1951	5	157
1939	1	28	1952	1/2	11
1940	6	276	1953	1	5
1941	8	73	1954	1	16
1942	7	132	1955	0	0
1943	8	174	1956	0	0
1944	4	94			

1/ Both before effective date of Federal Coal Mine Safety Act.

TABLE 4. - Underground fatality experience in coal industry, Titles I and II mines

	1956 2/	1955 2/	1954	1953	1952	1951
Anthracite:						
Title I mines:						
Fatalities	12	10	15	11	16	8
Rate 1/	10.62	9.41	11.48	18.33	17.15	8.05
Title II mines:						
Fatalities	36	39	36	49	69	81
Rate 1/	1.51	1.74	1.31	1.20	1.08	1.20
Total fatalities	48	49	51	60	85	89
Rate 1/	1.92	2.09	1.77	1.45	1.32	1.30
Bituminous:						
Title I mines:						
Fatalities	70	57	55	57	60	69
Rate 1/	2.52	2.10	2.16	2.70	2.32	2.41
Title II mines:						
Fatalities	271	243	236	292	329	549
Rate 1/	1.15	1.05	1.09	.95	.87	1.32
Total fatalities	341	300	291	349	389	618
Rate 1/	1.29	1.16	1.20	1.06	.97	1.39
All coal:						
Title I mines:						
Fatalities	82	67	70	68	76	77
Rate 1/	2.84	2.38	2.62	3.13	2.84	2.61
Title II mines:						
Fatalities	307	282	272	341	398	630
Rate 1/	1.18	1.11	1.11	.98	.90	1.31
Total fatalities	389	349	342	409	474	707
Rate 1/	1.35	1.24	1.26	1.11	1.01	1.38

1/ Per million man-hours.
2/ Figures for 1955 and 1956 subject to revision.

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